





Breakwater and jetties



Bridges



Drawbridges



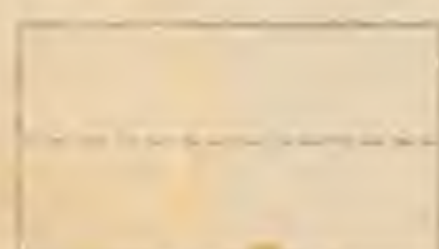
Ferry
(pontoon or cable)



Ford



Small park or cemetery line



Triangulation or primary traverse monument



U.S. mineral monument



Boundary monument



Canal



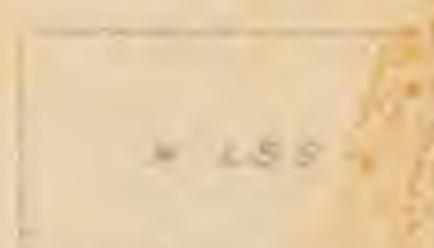
Main tunnel
(showing direction)



Lighthouse or beacon



Lightship



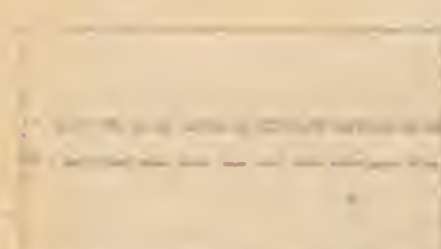
Life-saving station

WATER

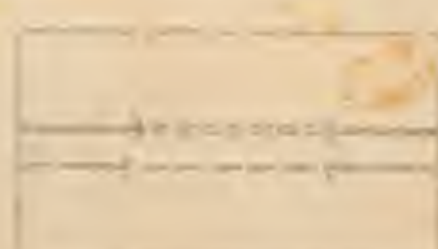
(printed in blue)



Canals



Aqueducts or waterpipes



Aqueduct tunnels

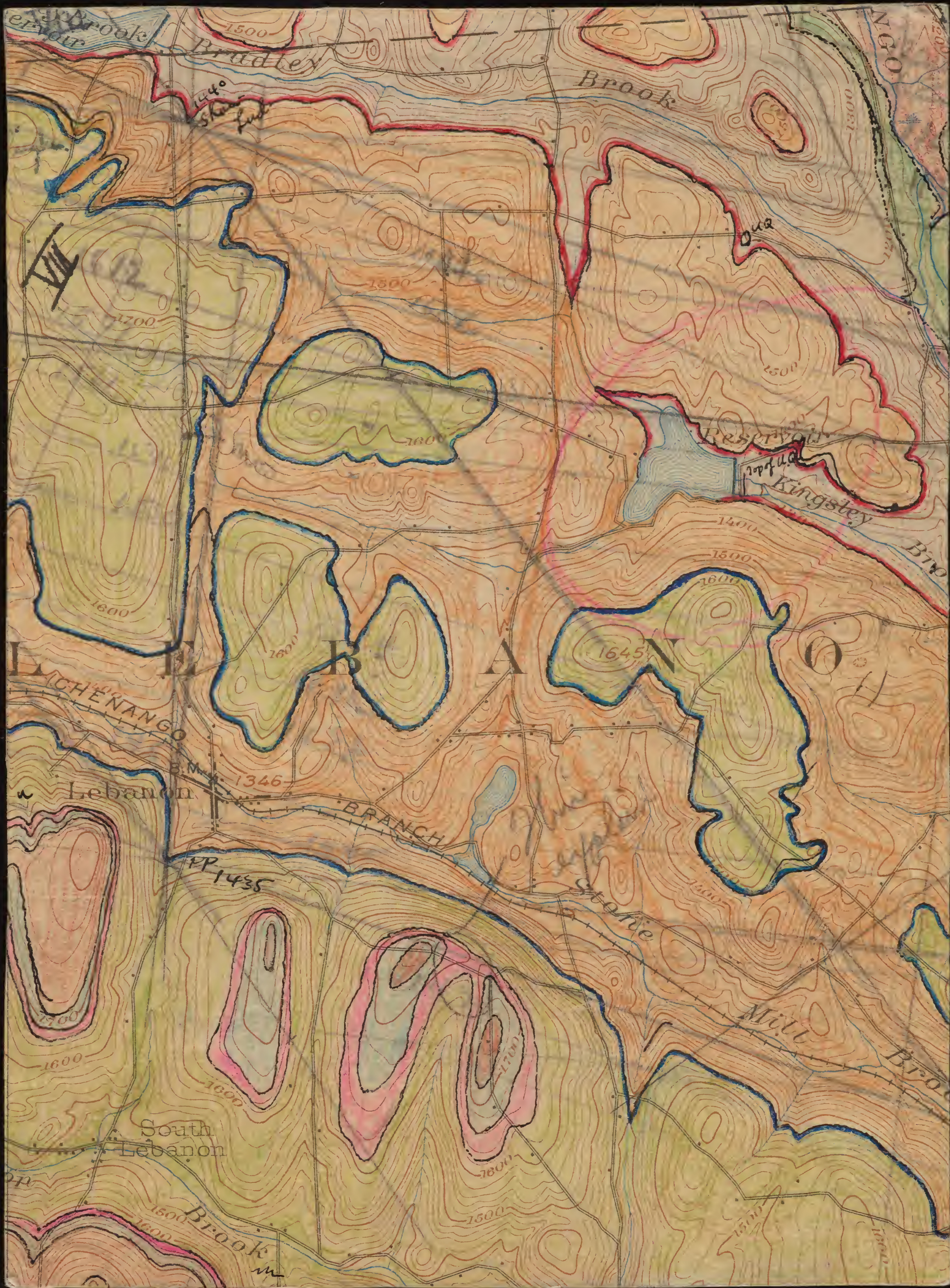


Lake or pond



Unsurveyed stream and abandoned canal



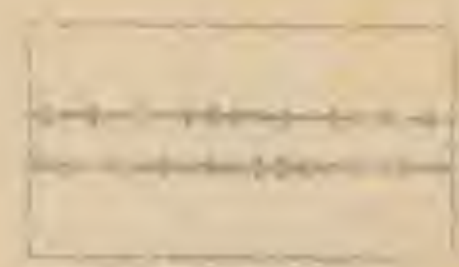


CONVENTIONAL SIGNS

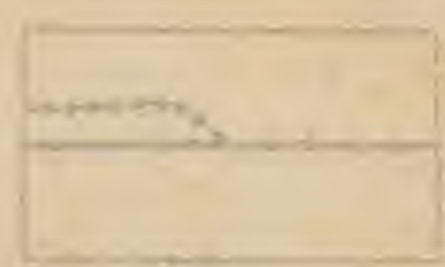
CULTURE (printed in black)



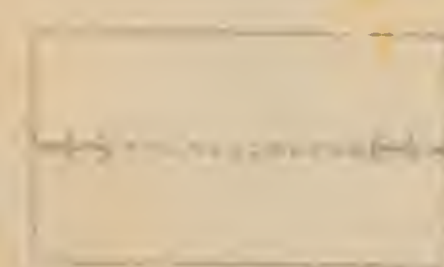
Trail or path



Railroads and stations



Electric railroad



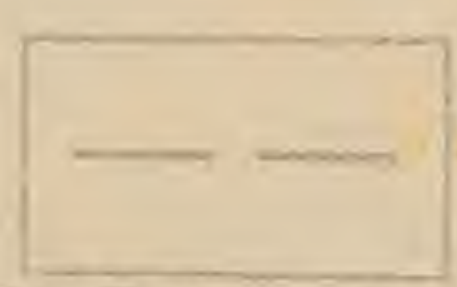
Tunnel



Wharves



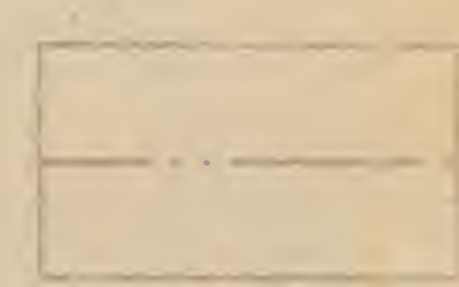
County line



Civil township or district line



Reservation line



Land grant line



Oil wells



Mine or quarry



Prospect



Shaft



Streams



Falls and rapids



Intermittent streams and ditches



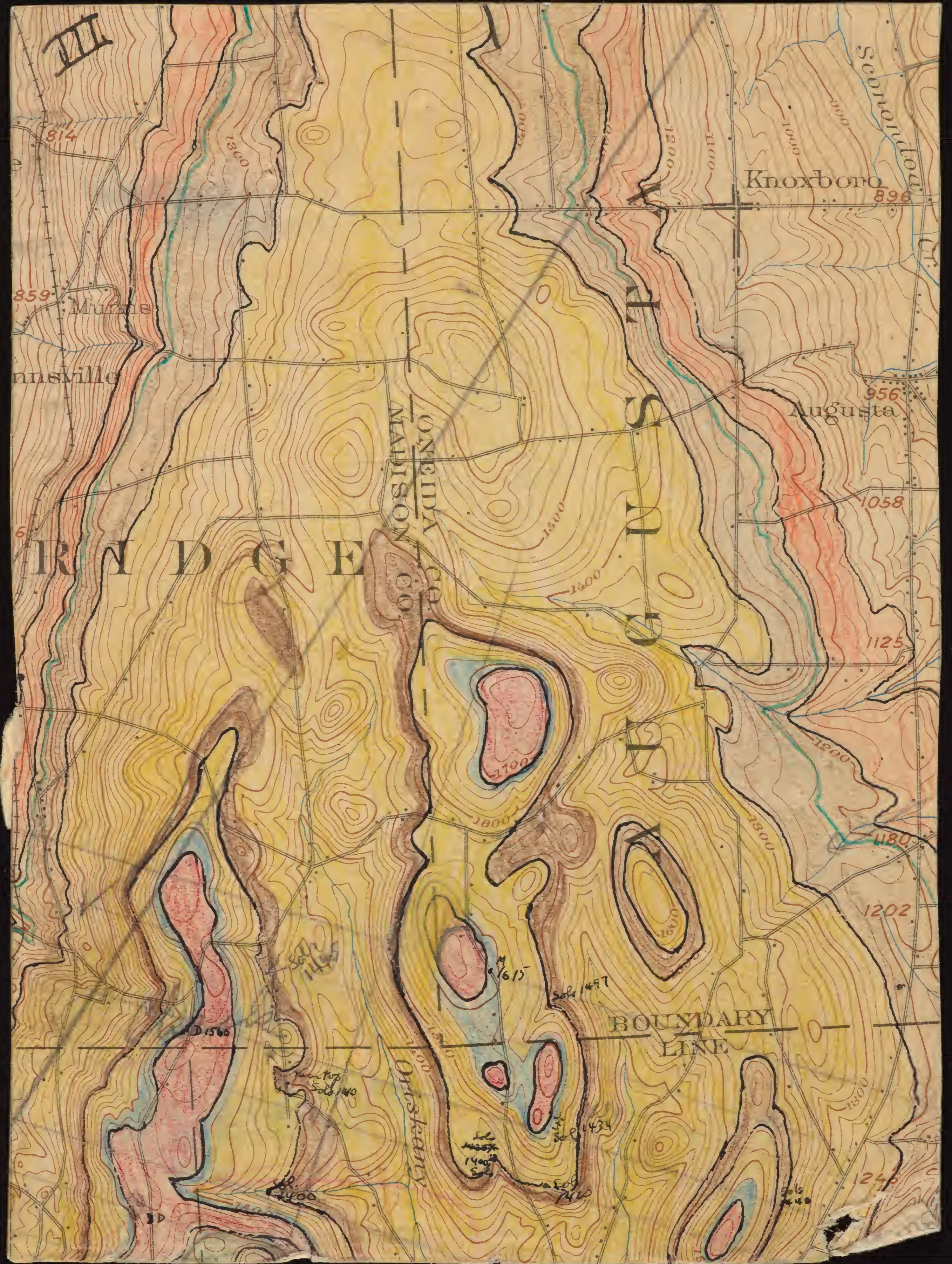
Intermittent



Cave



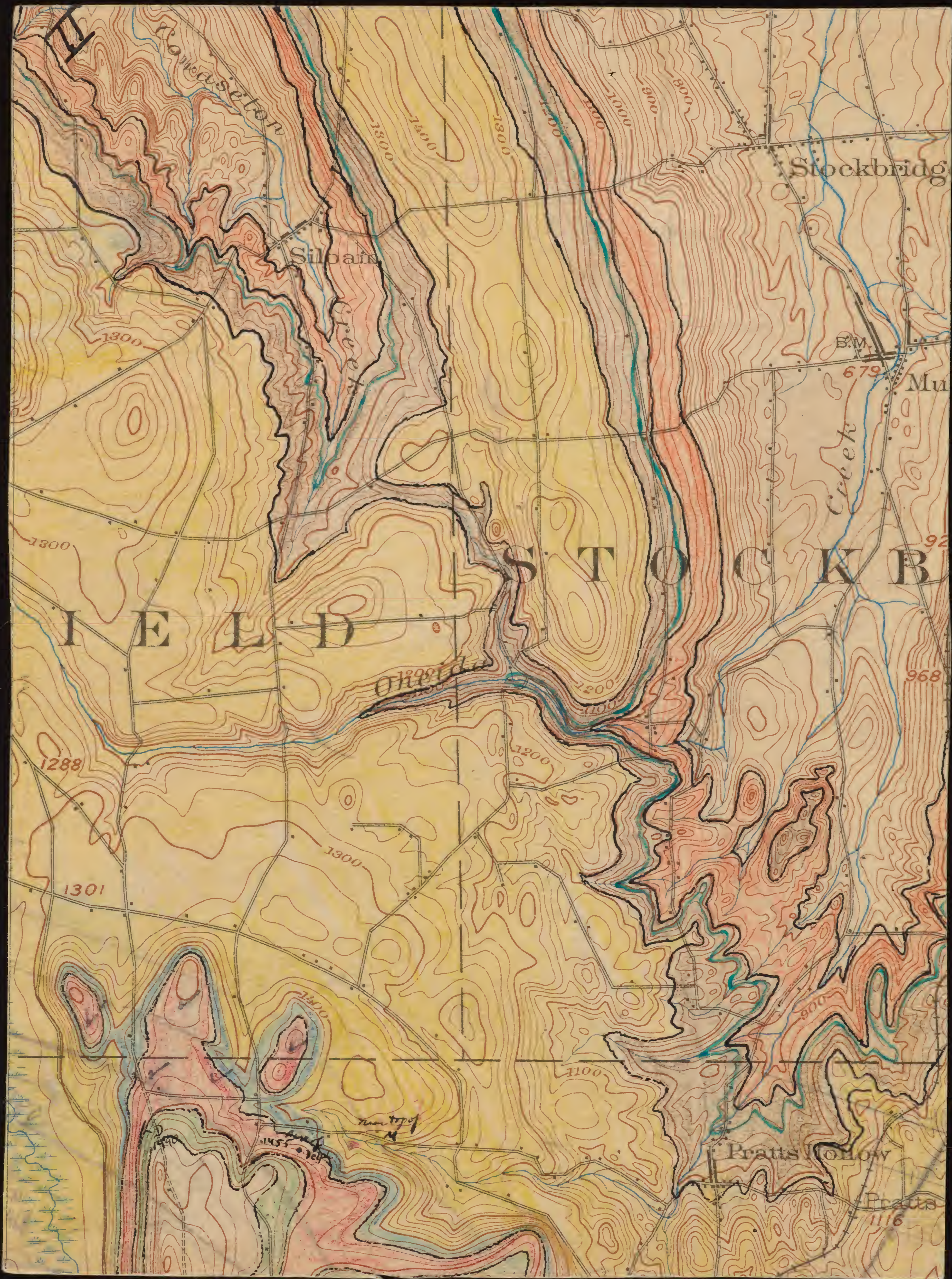
Salt



United States Geological Survey is now
a part of the United States, and since 1882, and its results consist of published maps of
about 40 per cent of the country, exclusive of outlying
lands.

Topographic atlas is published in the form of maps on
measuring about $16\frac{1}{2}$ by 20 inches. Under the general
adopted the country is divided into quadrangles bounded
parallels of latitude and meridians of longitude. These
angles are mapped on different scales, the scale selected
on map being that which is best adapted to general use in
development of the country, and consequently, though the
maps are of nearly uniform size, they represent areas of
different sizes. On the lower margin of each map are printed
scales showing distances in feet, meters, and miles.
On the scale of the map is shown by a fraction expressing
the ratio between linear measurements on the map and cor-
responding distances on the ground. For example, the scale
means that 1 unit on the map (such as 1 inch, 1 foot, or 1
represents 62,500 similar units on the earth's surface.
Though some areas are surveyed and some maps are com-
and published on special scale for special purposes, the
and topographic surveys for the and
result maps have many years been and
distributed as follows:

1. Areas in which there are problems of great



GRAPHIC MAPS OF THE UNITED STATES

boundaries. The conventional signs used to represent these features are shown and explained below. Various features from some earlier maps, and additional features are represented on some special maps.

All the water features are represented in blue, the sea and great rivers by single blue lines and the larger streams, creeks, and brooks by blue water lining or blue flow lines. Intermittent streams—those whose beds are dry for a large part of the year—are shown by lines of blue dots and dashes.

Relief is shown by contour lines in brown, which on some maps are supplemented by shading showing the effect of light thrown from the northwest across the area represented, for the purpose of giving the appearance of relief and thus aiding in the interpretation of the contour lines. A contour line represents an imaginary line on the ground (a contour) every part of which is at the same altitude above sea level. Such a line could be drawn at any altitude, but in practice only the contours at certain regular intervals of altitude are shown. The line of the seacoast itself is a contour, the datum or zero altitude being mean sea level. The 20-foot contour would be the line of the sea if the sea should rise 20 feet. Contour lines show the shape of the hills, mountains, and valleys; as well as the altitude. Successive contour lines that are far apart indicate a gentle slope; lines that are close together indicate a steep slope; and lines that run together indicate a cliff.

The manner in which contour lines express altitude, form,



below.



The sketch represen
tation of the
enclosed/
terraces
of the
river





City or village



Roads and buildings



Ruins Cliff dwelling (distinguished on recent maps only)



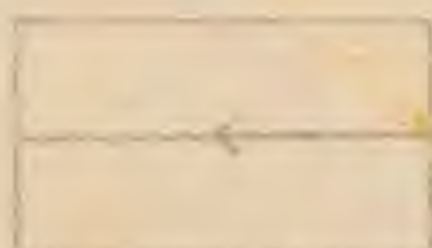
Metal road



Post office



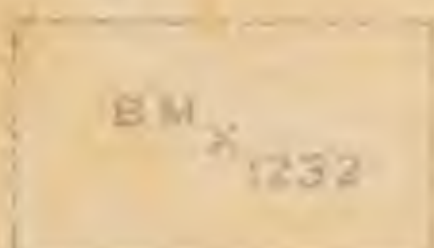
Dam Dam with lock



Canal lock U.S. tower and section lines and located corners (point upstream)



State line



Bench mark



Cemeteries



Church School (distinguished on recent maps)



Coke ovens



Gas well oil reservoir

Temporary bench mark shown in brown color and black figures without lettering

RELIEF

(printed in brown)



Figures

showing height above mean sea level instrumentally determined



Contours

(Contours showing depth of water printed in blue)

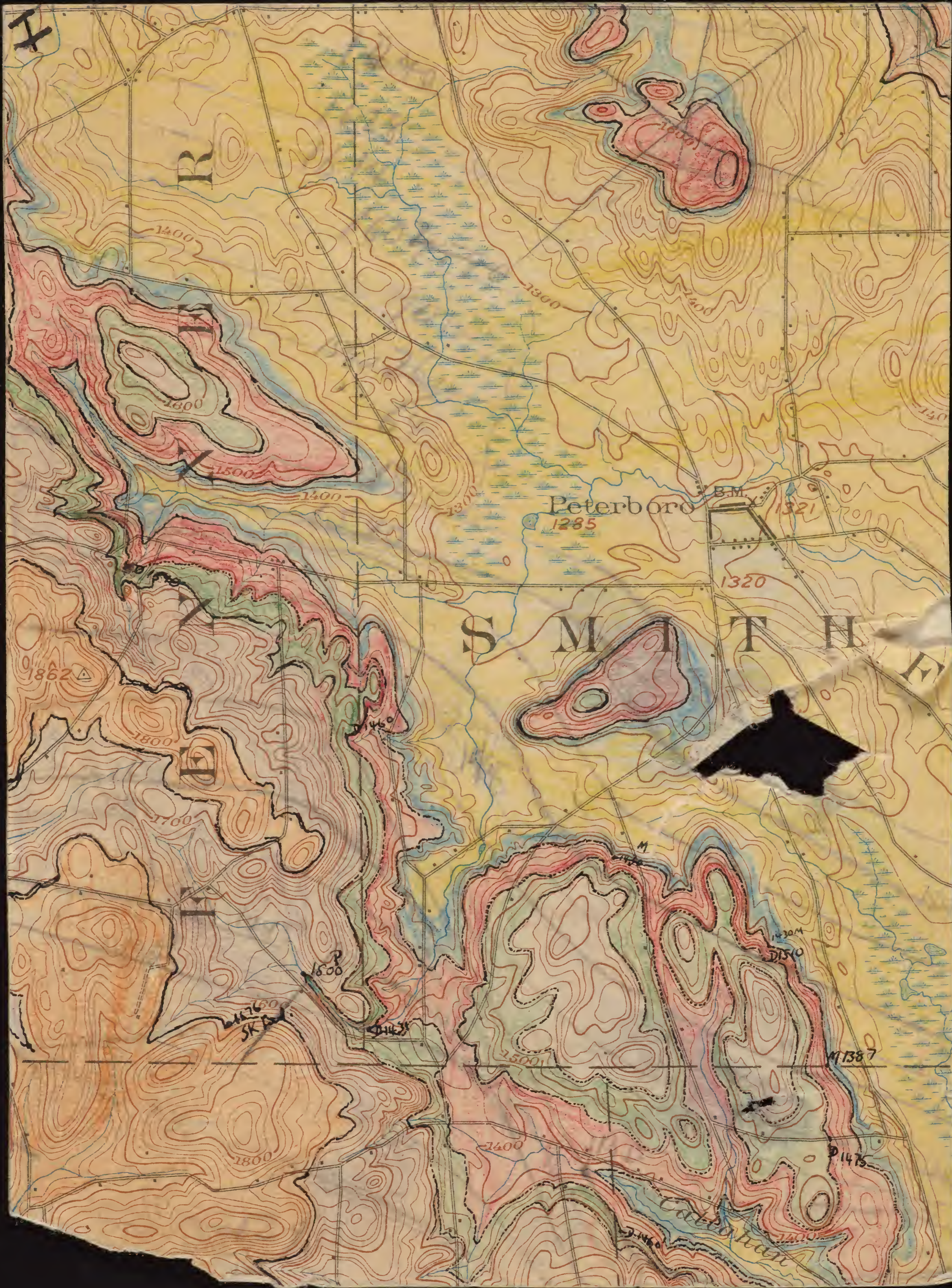


Depression contours



Levee





D STATES

their lower ends by a sea cliff. The hill at the left terminates abruptly at the valley in a steep scarp, from which it descends gradually away and forms an inclined table-land that is intersected by a few shallow gullies. On the map each of these features is represented, directly beneath its position in the sketch, by contour lines.

The contour interval, or the vertical distance in feet between one contour and the next, is stated at the bottom of each map. This interval differs according to the topography of the land. In a flat country it may be as small as 1 foot; in mountainous regions it may be as great as 250 feet. Contour lines at the fourth or fifth one, are made heavier than the others. They are accompanied by figures showing altitudes at certain points—such as road corners, summits, and bench marks—are also given on the map. The altitudes are given to the nearest foot only. The locations of bench marks—as well as the geodetic triangulation stations, are published in bulletins issued by the Geological Survey.

Let us now consider the works of man as shown in black. Boundaries of a State, county, city, land grant, township, and railroad are shown by continuous or broken lines. Railroads are shown by continuous or broken lines with cross-ticks and weights. Metalled roads are shown by double lines, one of which is accentuated. Other public roads are shown by a double line, private roads by a dashed double line, and trails by dashed single lines.



Each quadrangle is given the name of a city, or prominent feature, and on the margin printed the names of adjoining quadrangles which have been published. Over 3,000 quadrangles have been surveyed, and maps of the same are on the other side of this sheet have been published.

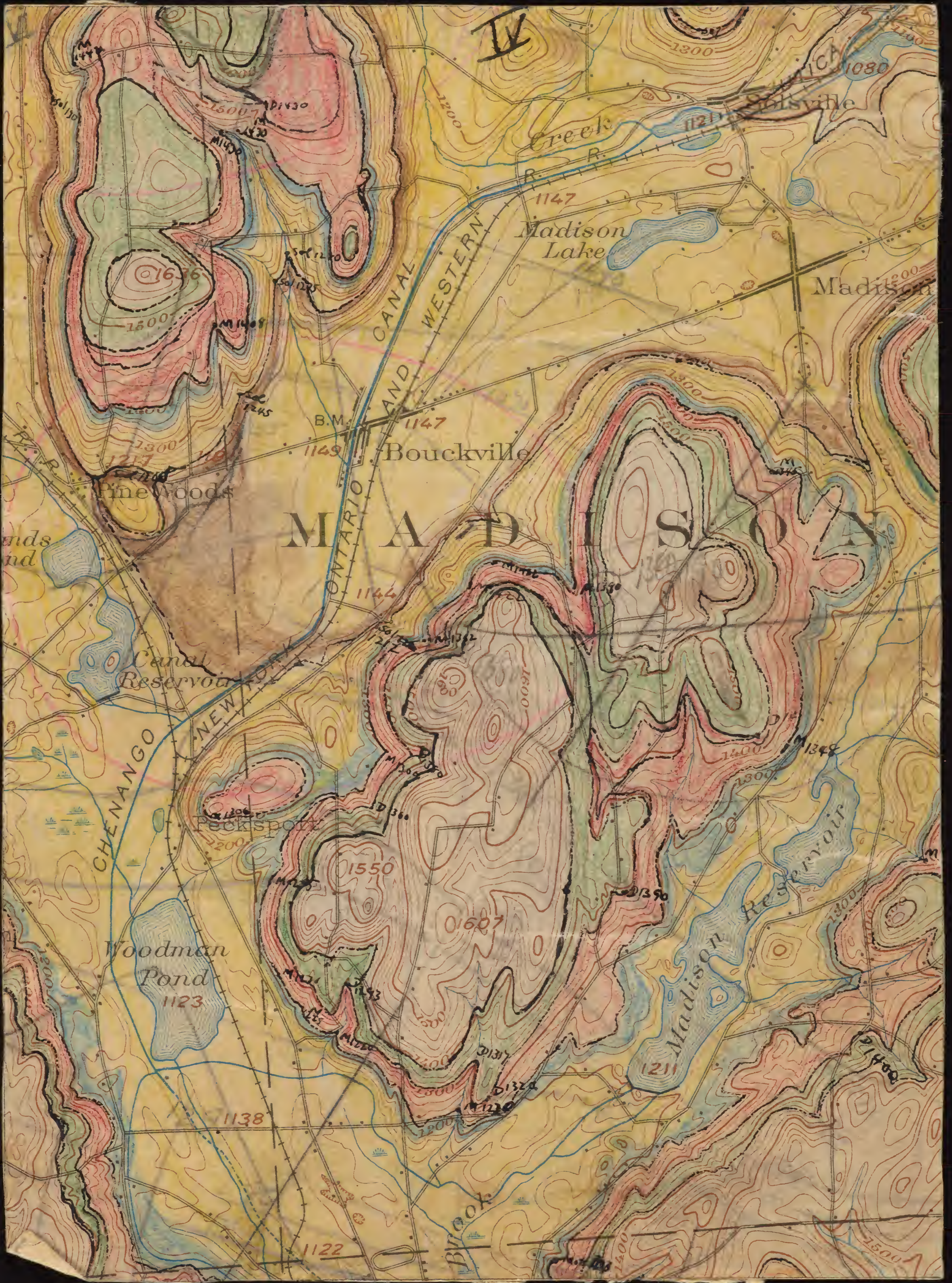
The topographic map is the base on which the geology, mineral resources of a quadrangle are represented, and maps showing these features are bound together with a descriptive text to form a folio of the Geologic Atlas of the United States. More than 200 folios have been published.

Index maps of each State and of Alaska and Hawaii showing the areas covered by topographic maps and geologic folios published by the United States Geological Survey may be obtained free. Copies of the standard topographic maps may be obtained at 25 cents each; some special maps are sold at different prices. A discount of 40 per cent is allowed on an order for maps amounting to \$5 or more at the retail price. The geologic folios are sold for 25 cents or more each, the price depending on the size of the folio. A circular describing the folios is available.

Orders for maps or folios should be addressed to the Director, United States Geological Survey, Washington, D. C. (not postage paid).

DIRECTOR,

United States Geological Survey,
Washington, D. C.



importance—relating, for example, to mineral dev-
elopment, or reclamation of swamp areas—are made
with sufficient accuracy to be used in the publication of maps
(scale = 1 inch = one-half mile), with a contour inter-

val of 10 feet. Surveys of areas in which there are problems of average
importance, such as most of the basin of the Mississippi
tributaries, are made with sufficient accuracy to be used
in the publication of maps on a scale of $\frac{1}{62,500}$ (1 inch = nearly
1 mile), with a contour interval of 10 to 25 feet.

Surveys of areas in which the problems are of minor
importance, such as much of the mountain or desert
regions of Arizona or New Mexico, are made with sufficient
accuracy to be used in the publication of maps on a scale of
 $\frac{1}{125,000}$ (1 inch = nearly 2 miles), with a contour inter-

val of 20 feet. The topographic survey of Alaska has been in
progress since 1898, and nearly 37 per cent of its area has now been
surveyed. About 10 per cent of the Territory has been covered by recon-
naissance maps on a scale of $\frac{1}{625,000}$, or about 10 miles to an

inch. Most of the remaining area surveyed in Alaska has
been mapped on a scale of $\frac{1}{250,000}$, but about 4,000 square miles
has been mapped on a scale of $\frac{1}{62,500}$.

Most of the Hawaiian Islands has been surveyed, and
the maps are published on a scale of $\frac{1}{125,000}$. The
features shown on these maps may be divided into three
classes—(1) water, including seas, lakes, rivers, and
other bodies of water; (2) land, including mountains, hills,
valleys, and plains; (3) other features, including cities,
towns, and villages of man).

1927

802 d



1927

802C



1928

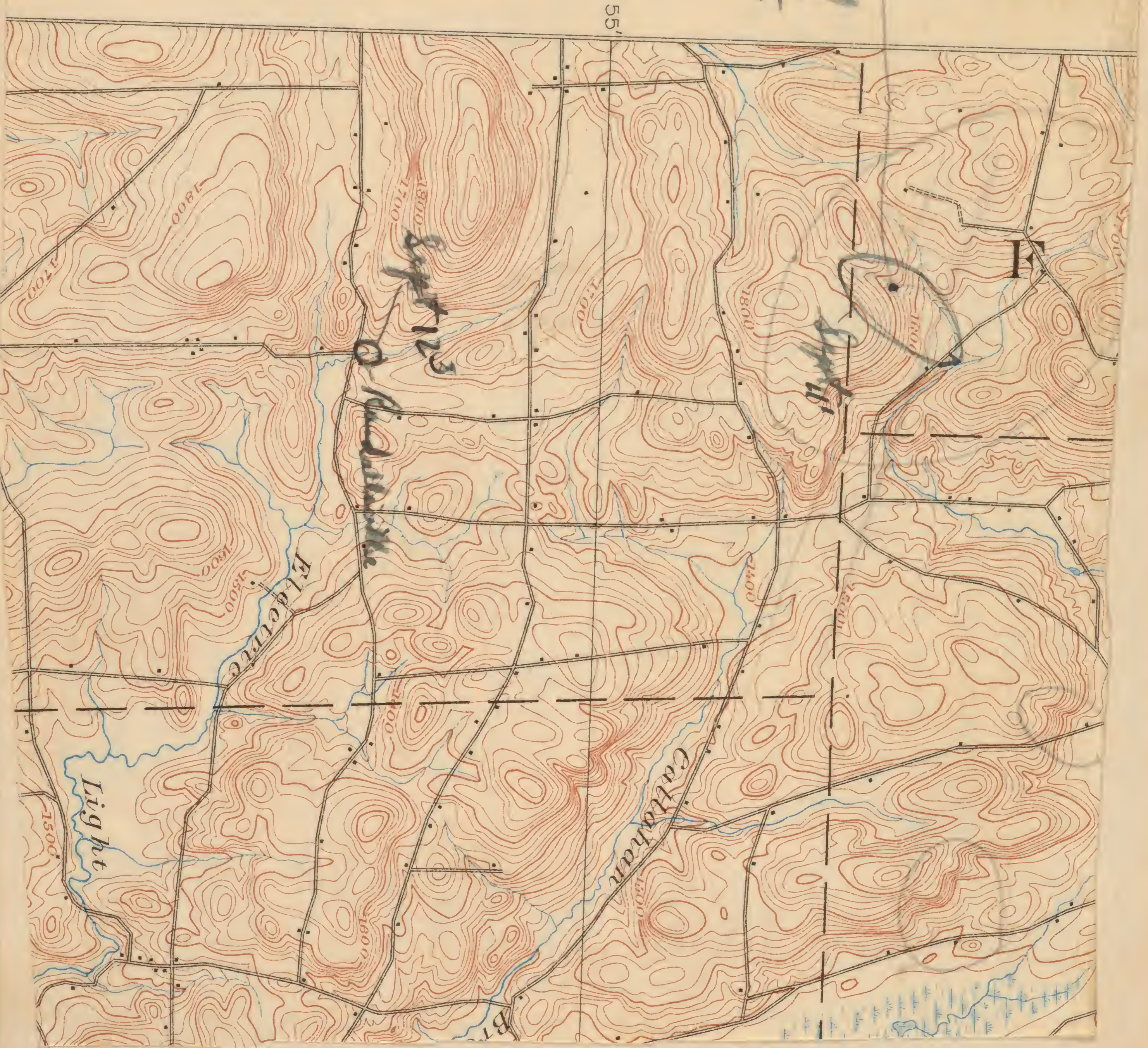
802 m

167
60
227

1560
40
1520

1678
60
1518

1676'
Steam-ford
Contact



54
5
270

54
8

1927

802e



802f

*Plumbeous
notably in the
Munnsville or
Heldberg about
980.*

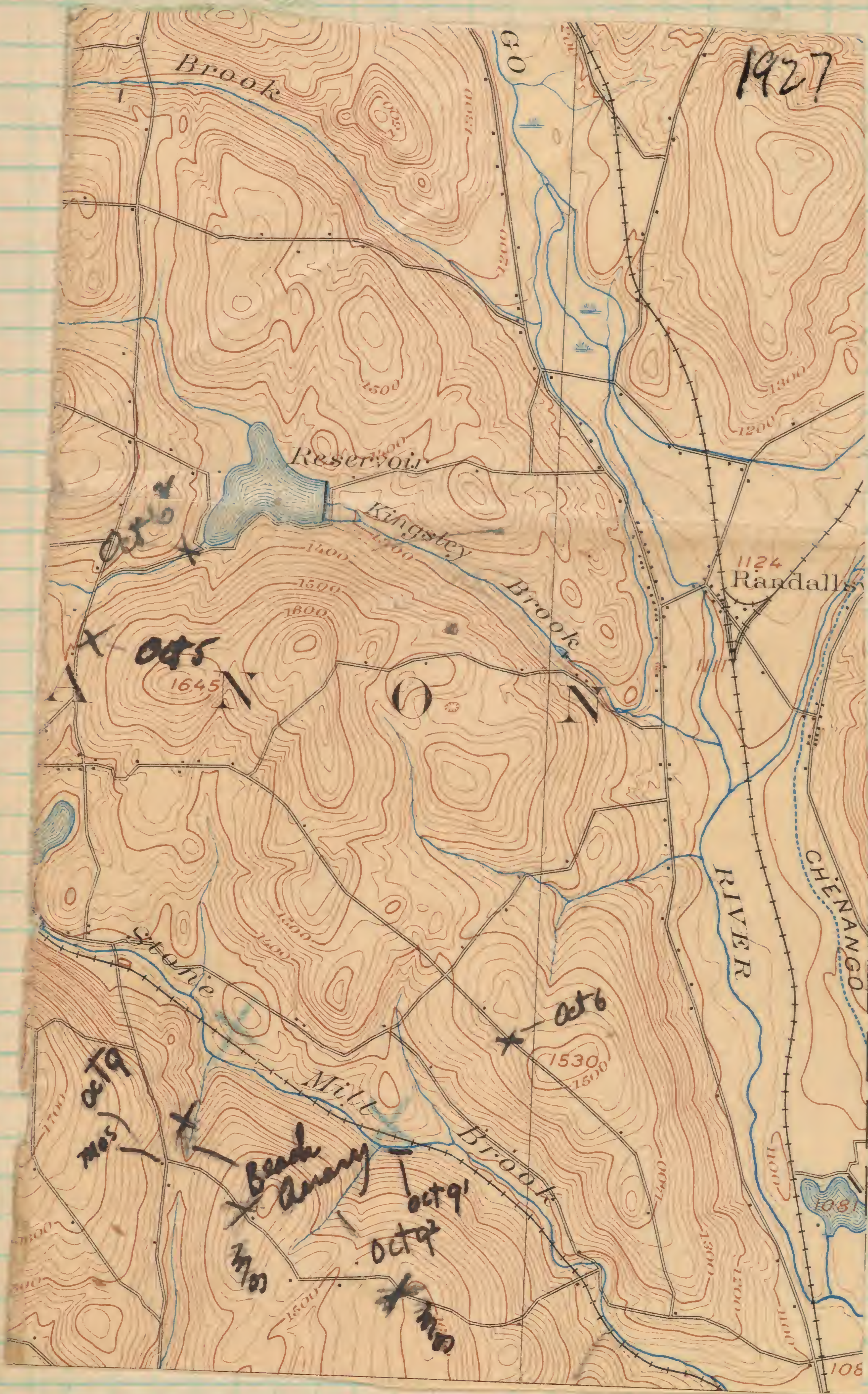
1927 $\frac{1070}{40}$
 $\frac{1110}{10}$

RAPHY

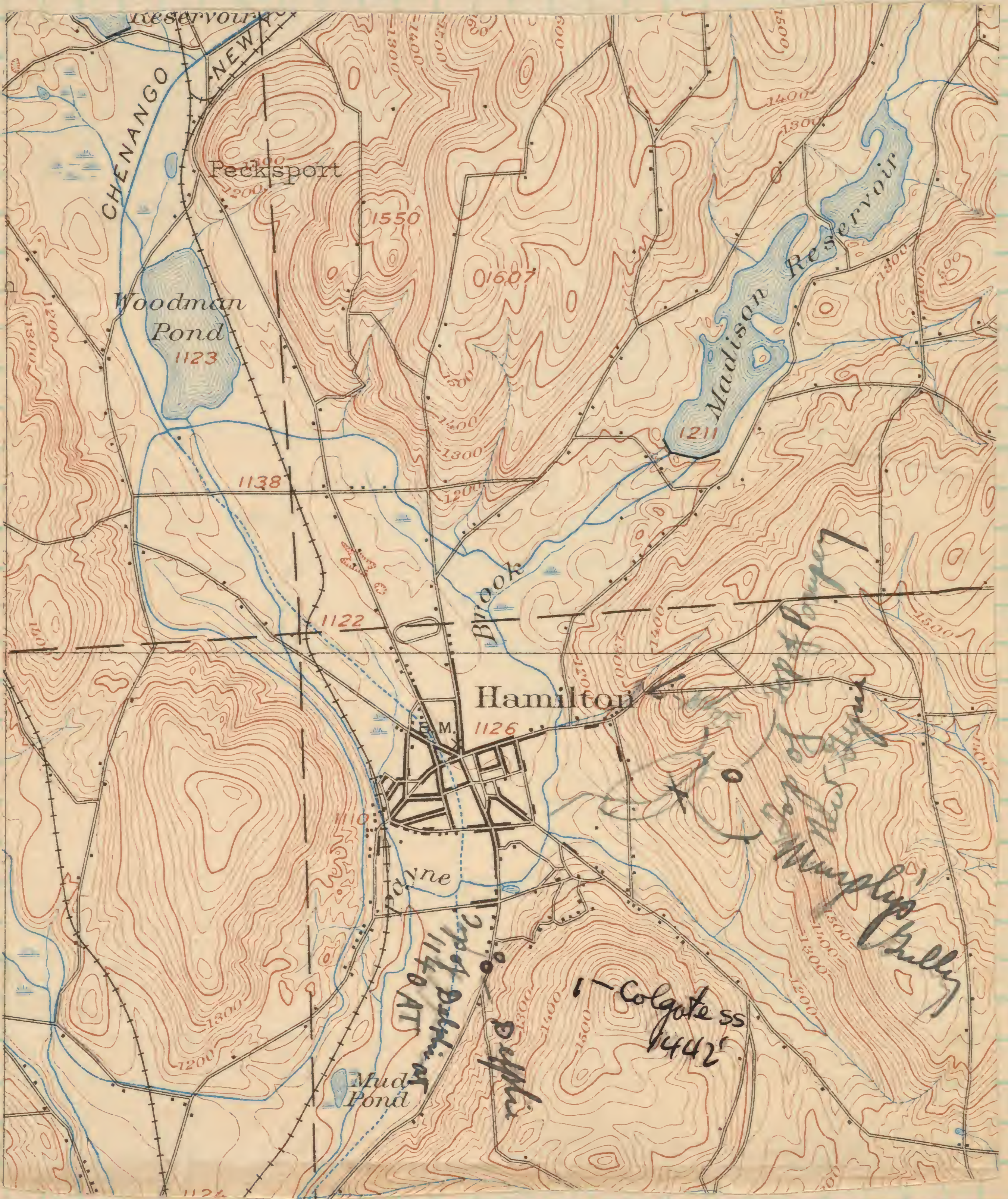
MORRIS















802 i



1928
802 f

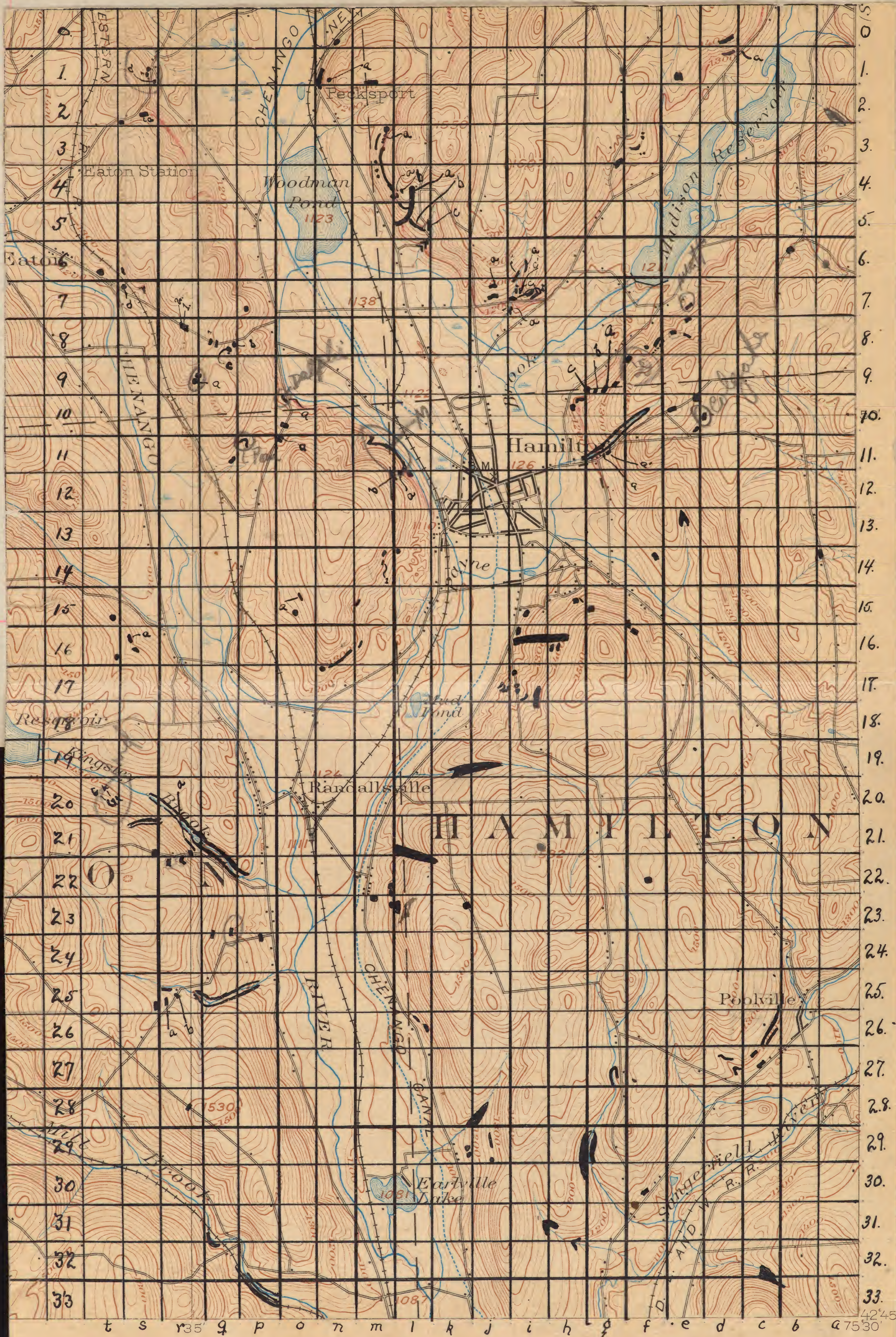


8020

					
Dam	Canal lock (point up stream)	U.S. township and section lines and located corners	State line	County line	Civil Territory or district line
					
Bench mark (Temporary bench marks shown by brown cross and black figures without lettering)	Cemeteries	Church	School	Coke ovens (distinguished on recent maps)	Mine shaft

RELIEF
(printed in brown)

				
Figures (showing heights above mean sea level instrumentally determined)	Contours (showing height above sea level instrumentally determined and steepness of slope of the surface)	Depression contours	Levee	Stream
				
Wash	Cliffs	Mine dumps	Sand and sand dunes	



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t s r35 q p o n m l k j i h g f e d c b a7530

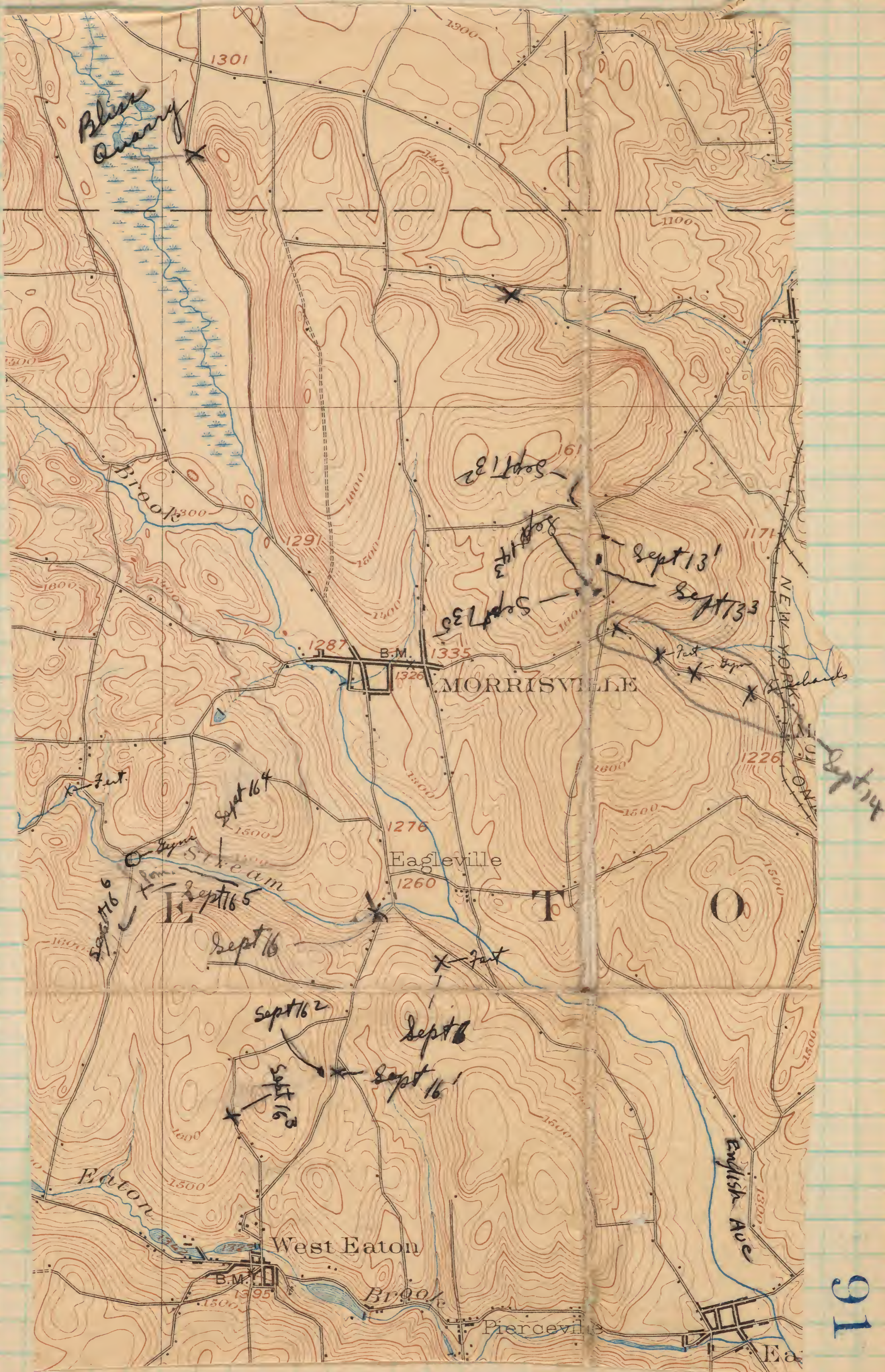
42°45'

7208

1928



802 m



803

803

June 12, '27
Werners Quarry

Georgetown Quarry

More extensive digging has revealed
other *S. laevis* and banded *S. laevis*
which bear corals.

Revisit

laevis

C. recurva
S. junia ?
R. fimbriata ~
M. concentrica c
S. perplana ~
J. carinatus c.
G. circularis ~
P. nuda ~
P. rana ~
C. boothi ~
P. patulus
P. perplana - quite c

Anthracantha ?
Gilbertsocrinus ?
Starfish 2?

June 13, 27

Georgetown - Lebanon R.R.

10-15' blue shales. These correlate with the horizons shown in the bed of the brook at 7CE2 (see map ?). Along the level of the track the shales are like those in the stream bottom near the road but about 15' above they are like those in the ravine at the first falls.

Windom

*P. Rana**A. umbonata**P. emarginata**A. spiniferoides**S. granulosa**C. bellostriata**O. undulata**G. tenuistriatus* (C in lower beds)*S. pennatus**R. fimbriata**M. concentrica**Schusettella clemyensis* C in upper beds.*N. oblongatus**G. tenuistriatus**P. munita**O. parvula**A. decussata**C. indentata**N. bellostriata**Pal. concentrica**J. exigua**M. mytiloides**H. acclis**Parallelocladon hamiltonianus**C. boethi*

June 13. 27

70 ft. above railroad tracks (7a H4) (map?) about
5 or 6' thick, shale, coarse from weathering. These
form ridge of first terrace in hill. Fossils
are abundant but not in great variety. The
commonest are -

S. pennatus

S. carinatus

Large *Spirifer* (*S. granulosus*, one of them)

Curved stems

R. vanuxemi

M. concentrica

C. rostratus

C. mucronatus

A large *Platystrophia*

This horizon may be same as Georgetown
 Quarry but is probably lower.

807

807

June 13, 27

7BC3

A. erectum C*I. carinatus**S. salenoides**L. pteris* sp.*L. pteris**L. pteris**O. undulata**P. petulus**P. maxime**C. coronatus**L. rogersi**P. altifrons*

joints

N 64 E

N 71 E

In places the outcrops are foliated & striated. Direction of strike is -

N 44 E

N 44 E

Coarse blue shale, weathering brown to purplish, exposed along roadside. Notable for large numbers of *I. carinatus* & *A. erectum*. This rock looks like the shale first visited at 7BC5, but is much lower down.

June 13. 27

7B.D5 about 9' of bluish weathered shale
The fauna is only notable because
of the large numbers of *I. carinatus*.
I believe the horizon to be near that of
the Georgetown quarry.

I. carinatus c.
A. princeps
S. perplana
O. undulata
Igonurus v.c.
S. pennatus
Leptenia sp.
Nucula bellistriata
Chonetes sp.
M. pygmaea r.
H. deHarzi
P. sectifrons
S. chesungensis

June 13 Ludlowville

7B D2 + 7B D3

About 200 yds^N from 7B C3 is another large outcrop of rock lower in the series. There at the bottom the stone is a heavy coarse shale but about four feet from the road level there is a thin, local band of shell ls. composed of *S. pennatus*, *C. coronatus*, ^{large spiny} and *Camarotoechia*. Above this and exposed for about 3' vertically is a thin slabby ls. which breaks into flat plates less than an inch in thickness. In this layer are also found large concretions (small round ones) like those of the University Quarry. This fauna here has large *Camarotoechia* and also *P. flabellum*.

50 yds N of this outcrop and on the opposite side of the road and in the fields are coarse shales weathered to a blue grey on the fracture but brown on the surface. Fossils here are

A. princeps
Camarotoechia - very large
G. obsoleta
R. grandis
P. patulus
A. erectum
P. flabellum
S. pennatus
S. perplanus
C. boothi

The slabby sandstone gives way to shale like itself again about 12' above road-level.

See next page

49 ft above the road-level is a small outcrop of arenaceous shales like those below. The shale is light gray from weathering.

Fossils

M. concentrica

L. pennatus

T. carinatus

A. erectum

P. flabellum

Large sp. - granular?

Ludlowville

June 14. (1)

(1)

Small outcrop in road, of grey weathered shale. Fossils are rare, ~~one~~ ^{one} species being identified. This ledge could not be correlated

Camerozoechia sp.
H. debayji

Ludlowville

June 14 (2)

Coarse arenaceous weathered shales exposed in the road-bed. These are characterized by an abundance of *Lepteria*s and *Tropidoleptus*. The rock is exposed in road gullies for fully forty or 50'.

The fauna for the first 15' of the exposure is as follows:-

L. rogersi c
L. pennatus c
A. erectum c
T. carinatus c
H. triquetra
D. constata
H. debayji
P. flabellum
Pal. concentrica
L. granulatus
Ghammysia (?) Range
C. corobatus
S. perplana

Over

June 14 (2) cont

About 30' from base, the same kind of weathered shales.

<i>G. bisulcata</i>	<i>M. concentrica</i>
<i>I. exigua</i>	<i>H. deKayi</i>
<i>S. pennatus</i>	<i>P. radiata</i>
<i>S. perplana</i>	<i>C. corrugata</i>
<i>A. princeps</i>	<i>I. caninatus</i>
<i>C. boothii</i>	<i>N. triquetra</i>
<i>A. erectum</i>	<i>P. flabellum</i>
<i>C. boothii</i>	<i>S. granulatus</i>
<i>P. emarginata</i>	<i>S. Chemungensis</i>
<i>C. coronatus</i>	

At top of hill about 30' from base

<i>C. complanata</i>	<i>H. deKayi</i>
<i>N. triquetra</i>	<i>L. pteris</i>
<i>S. pennatus</i>	<i>P. flabellum</i>
<i>I. caninatus</i>	<i>S. granulatus</i>
<i>H. globosa</i>	<i>P. maximum</i>
<i>C. coronatus</i>	<i>S. perplana</i>
<i>N. liata</i>	

On the very brow of the hill the shales are very sandy and split into flat layers.

June 14⁽³⁾

Gorge just SE of Erieville. In bottom of ravine. Bluish shales splitting irregularly

*O. undulata**T. submarginata**O. carinata**S. perplana**A. erectum**Leiopteria* sp.*M. oblongatus**T. carinatus* cc*M. mytiloides**S. pennatus* cc

✓

16' above base a local hard band with *S. pennatus* has formed a flat or cascade joints at this level read:

N 26 E

N 30 E

And have a complementary set.

On the hard layer the stone is sandier and has many *Blonetes*.

The top of the falls is 27' from the base of the first exposed rock. The falls is formed by the harder arenaceous rock.

At about 29' from base of ravine, and forming a flat in the ravine is a hard band about 1' thick, responsible for the falls. This band contains

Large *Strophodonta junia* (?)*Aulopora serpens**R. vanuxemi**M. concentrica**S. pennatus*

Fenestellid bryozoa

A. decussata

Near top of
Lud.

The topmost 6" layer of this ls. which here is blue and has been honey combed by solution is quite pure.

on the ls rests more argillaceous
blue shales, which are considerably softer.
Their fauna ~~follows~~ follows.

Grummysia sp. small.

S. pennatus (~~small~~ ~~thin~~ ~~below~~)

O. carinata

C. demissa

B. lida

C. bellistriata

J. curvatus

P. sectifrons

N. oblongatus

N. bellistriata

A. erectum

C. coronatus

P. radiata

P. plana

M. concentrica

S. channingensis

M. mytiloides

Oribiculoides sp.

Aviculopecten cf. *scab.*

H. obsoleta

S. granulosa

G. bisulcata

about 10-15' of this soft shale
is exposed. The soft shales
may correlate with those in
the pavine at Georgetown (7CE)

June 14 (4)

Coarse arenaceous shale, weathered
to a light grey

Cyrtina hamiltonensis

C. mucronatus

S. pennatus

Plant stems.

Chonetes coronatus (1 1/2" along hinge-line)

S. granulosis

This stone splits into coarse irregular
slabs. The horizon could not be identified

East side Eueville Reservoir, 1 mi. NNE of Eueville

June 14⁽⁵⁾

Coarse bluish grey arenaceous shale
with few fossils. Large *Amastoechia*
link this horizon with 7Bc 3 visited
June 13.

Amastoechia sp.

M. oblongatus

Grenvillea sp.

G. circularis

P. flabellum

C. coronatus

Plant stems

P. emarginata

S. perrinitus

June 15⁽¹⁾

15' soft blue shale having the appearance of that found in Stone Mill Brook

Lower Moscow

A. umbonata
 N. lirata
 M. pygmaea
 C. scitulus c
 N. oblongatus
 C. boothii
 N. bellistriata
 Lox. hamiltoniae
 Crucid. stens
 S. solenoides
 O. carinata
 M. concentrica
 T. submarginata

S. punctatus c
 C. coronatus
 T. carinatus
 P. emarginata
 M. sulphureoides
 P. subata
 C. setigerus
 N. corbuliformis
 N. varicosa
 C. truncatula
 P. radiata
 H. dehayi

Moscow

June 15⁽²⁾

Blue shales, exposed in road gully for . These have the same appearance as the shales observed at J. 15⁽¹⁾. A few specks of well at Eatonville station. The splits into irregular slabs.

C. scitulus ()
S. pennatus .
O. thurax sp.
A. umbonata
C. coronatus
C. boothi
P. emarginata
O. undulata
S. perplanus

M. concentrica
 Plant stems
S. granulosa - abundant
 at top of hill

June 15⁽¹³⁾

The same interval of shale is exposed
in a small gully or ravine just east
of the farm house.

June 15⁽⁴⁾

Second ravine just E of J. 15⁽¹³⁾. not
visited, but according to farmer (Mr. Finer)
it contains shale at the same level
as on road and J. 15⁽¹³⁾.

June 15 (5-)

About 13' of alternations of shales (dark) and blue-grey sandstones. The bands of ss. are from 2' - 2 1/2' in thickness. No fossils were discovered in the sandstones.

In a 14' layer of shale *C. mucronata* was identified.

In the debris a *D. caninus* and *Crinoids* stems were located.

The bottom of these beds is at 1437'

p?

9" ss

4' bluish sh

with a few Chromites

1' heavy ss

7" sh

9" ss

1' sandy sh

2' ss heavy bedded for 1'

15" dark shale

1437'

2 1/2' slabby blue ss

↓ ?

J. 16⁽¹⁾

About 3' of grey arenaceous shales.
 Old fossils was located and the horizon
 could not be located in the section.
Pterinea flobellum. The horizon maybe the
 New Gyrus horizon? No

June 16⁽²⁾

Small exposure of flat slabby ss.
 with *I. caninus*. A harder layer at
 road level has *P. flobellum*, *A. arguta*
 and *Camarotoechia*. This may be near
 the the June 22. No

June 16³

7' of grey sandstones splitting into
 irregular slabs. These contain lenses
 of fossils that were formerly found
 well ls. but are now much leached.

Fauna

*C. recurva**C. coronatus**C. vicinus**S. audaculus**A. erectum**Tentaculites**C. congregata**Actinopteria**S. perflans**S. coronatus**C. coronatus**S. argutus*

J. 16⁽⁴⁾

Thin-bedded slabby sandstones with
Spicifer, *S. pennatus*, *C. mucronatus*, *C.*
M. mytiloides, *Goniophora* sp., *P. flabellum*
 all were noted in the lower layers.
 The stone above splits into very
 flat slabs. Rock is revealed inter-
 mittently both vertically and horizontally.
 The total vertical distance is about
 15'

June 16⁽⁵⁾

In road just east of J 16⁽⁴⁾ a
 horizon just below that of J 16⁽⁴⁾. The upper
 layers of about 10' ft. of rock exposed
 are sandy & split into flat slabs. The
 lower layers are darker and some-
 what shaly, although they are coarse. No
 fossils were noted here.

June 16⁽⁶⁾

5' black shales, no fossils noted.
 These may be the black shales below
 the U. Anagy.

June 16⁽⁷⁾

About 75 yds from 16⁽⁶⁾ dark shales
 in stream bed.

S. pennatus at 102 yds from 16⁽⁶⁾, also,
C. setigerus, *C. mucronatus*.

120 yds from 16⁽⁶⁾ *A. subrotunda*, *N. triquetra*.
 This name terminates behind the
 old mine house at Eaton.

The dark shales are those
 found at Eaton's locality, U.E. 1, p. 10.

June 16¹⁰

A small ledge of calcareo-arenaceous stone with many fossils. This is the same stone as in the upper ravine of J. 16⁹

Fossils here are numerous as
Tenestellid bryozoa *Cyrtina hamiltonensis*
P. rana

C. mucronatus
S. pennatus
 Grinoid stem segments
S. perplana
H. Debay

June 16¹¹

Berwyn Black, soft, fissile shales exposed in a stream bank, about 8' vertically. The fauna is sparse and consists mostly of *A. umbonata* and a few pelecypods, among them *M. oblongatus* and *M. subalata*. Other fossils are

Atypis sp.*S. pennatus**B. Reda**A* large snailJune 16¹²

1340' 24' exposure of shales and sandstones, shales at base and ss. above. In the upper ss *S. hamiltonensis* & *P. flabellata* are common. On ls. bands & lenses *Emella* & abundant *Comantocchia* are present.

Excellent for collecting & zone

in the thesis as the Eaton shales. The last shales seen are at about 1340-1360'. The shales at the head of this ravine must represent the transition into the rock of the University Quarry.

June 16th
Morrisville

Outcrop of sandy shale weathered grey with the typical assemblage of New Gym fossils. 1390'

N. arguta

H. deKayi

L. absoluta

L. machoptera

P. flabellum

A. boydi

A. pinus

P. liata

S. crotalum

S. nuntium

Camarotoechia sp.

In the ravine below this outcrop about 30' of shales are exposed that are typical of Chase's Glen and other localities.

June 16th

In upper ravine above the New Gym horizon are ~~black~~ ^{weathered} shales very sparse in fossils. The shale crumbles to small pieces.

Lingula sp.

Nucula sp.

Camarotoechia sp.

P. fragilis.

Productella sp.

The first rock encountered in this little ravine was at about 1400, a black shale falling to chips. Here *P. fragilis* was found. The rock becomes harder till at 1428 the rock is a hard sandstone, some of it is also probably limy.

June 17¹

At fork of Morrisville road to Eagleville a small exposure of hard calcareous arenaceous rock which represents the top of the New Gwyn horizon. Here were found *C. coronatus* in abundance and *B. boydi*, & *P. flabellum*.

June 17²

In a small cascade just below June 17¹, are exposed nearly 20' of shale belonging to the New Gwyn and the shales exposed in Upper Chas's Glen. No attempt was made to collect fossils.

June 17³

Small outcrops just west of Morrisville representing rocks very near to the top of the New Gwyn horizon. Here *L. macroptera* and *N. arguta*, *P. flabellum*, *I. exigua* were noticed.

June 17⁴

Mr. Top of Pompey.

Shales in roadside weathered and grey. I cannot place this shale in the section. It is too much weathered to identify lithologically and the fauna is too sparse. Fossils noted were

C. scitulus? *Camurotoechia* sp.
Leiopteria sp.
Spirifer sp.
Modiomorpha sp.
N. corbulariformis

This may belong to the uppermost shales along Payne St.

June 17⁵

A ravine giving excellent exposures of rock. This was examined by hand-level steps.
 1st step - ^{2nd} Soft bluish shales breaking into chunky fragments with rounded outlines. This is the shale exposed so well in upper Cluses Glen and forming the falls.
 Fossils noted in the 1st 5' of stone: -

<i>T. submarginata</i>	<i>S. mountain</i>
<i>N. oblongatus</i>	<i>D. arcuata</i>
<i>B. sulcomarginata</i>	<i>P. sectifrons</i>
<i>N. triquetus</i>	
<i>P. concentrica</i>	

2nd step - ^{3rd} The shales here are somewhat bluer and softer, breaking into chips.

<i>M. mytiloides</i>	<i>T. submarginata</i>
<i>H. dekeyi</i> (small)	<i>Lepteria</i> sp.
<i>C. boothi</i>	
<i>Homotoma micula</i>	
<i>B. sulcomarginata</i>	

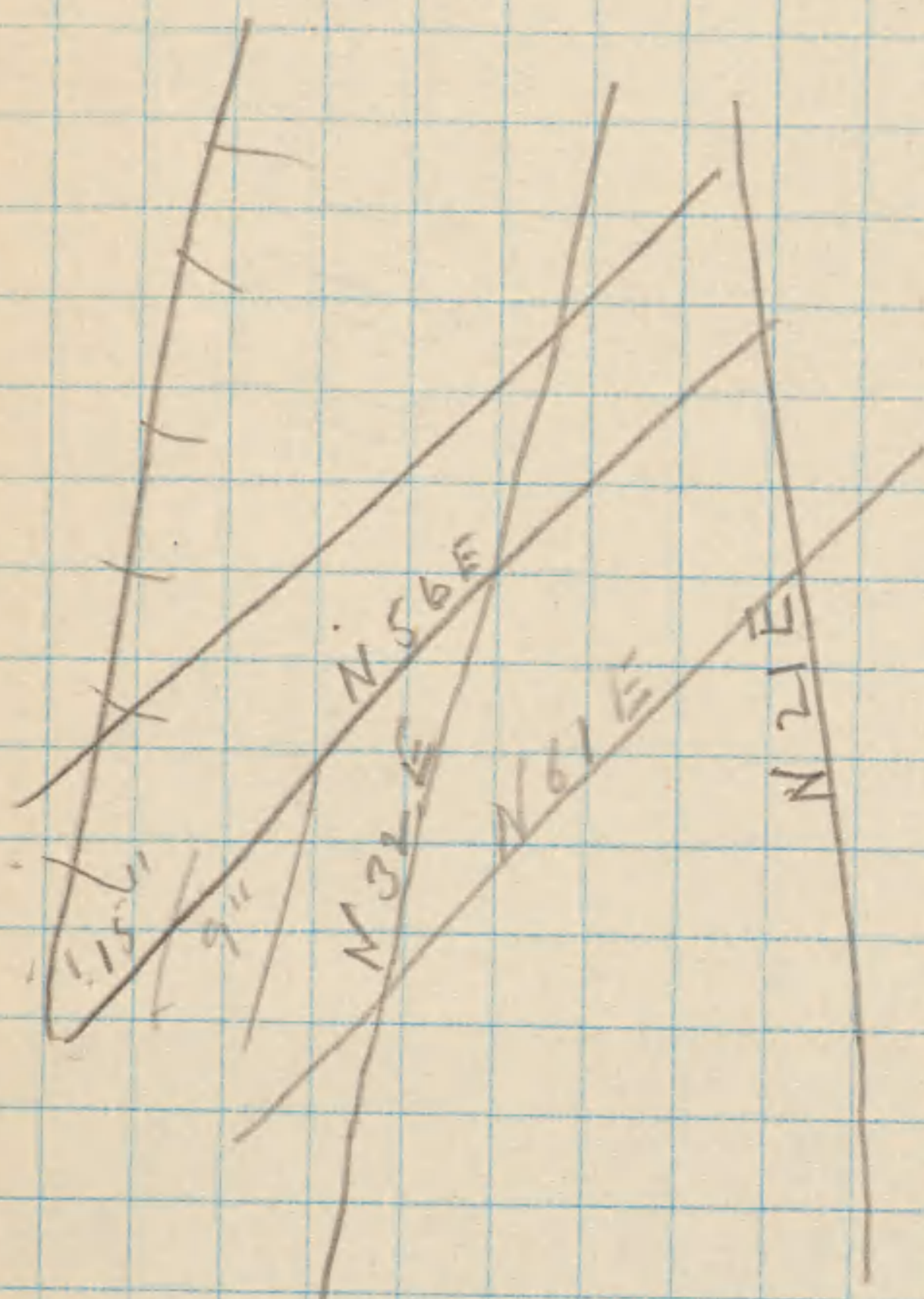
3rd - 4th step - Shales here in places somewhat harder.

4 - 5th step - The shales form larger slabs on weathering, and are grey-blue in color on fractured surface joints - see over.
H. dekeyi - large head

5 - 6 step - Taonurus c. shale like those in former step.

6 - 7th step - *A. fasciculatus*, *C. congregata*

7 - 8th step - *P. flabellum*, *B. sulcomarginata*
 The stone has become hard and breaks naturally into large irregular blocks.



8-9 step - same as 7-8.

9-10th step - calcareo-arenaceous shale
of top of New Gyn. with

M. mytiloides

S. pectinata

S. granulosa

Camarotoechia sp.

10-11th step - 5' of hard massive
rock with large *Paleyopods*.

M. mytiloides

A. princeps

Taenium

11th step to 3' vertical - very top of N. Quarry
horizon. Here are ss, thin and shaly
with *P. flabellum* and great numbers of
C. coronatus. This hard top layer forms
a flat just below the road intersection

About 63' vertically are exposed in this
ravine

The very top of the New Gyn. horizon
is here at about 1400' - 1410'

827

827.
~~828~~June 18¹

Small sections of dark shales. In the lower of the two outcrops there is a band of sandstone about 1 1/2" thick. On the upper outcrop one or two fossils were found.

*C. mucronatus*A small *Spirifer*

These shales probably belong to the black shales on top of the ls. at J 17¹.

June 18²

At 1505-1510' about a foot of shale is exposed at the roadside. The stone is grey and breaks into large irregular slabs, and is much coarser than that found at June 18¹. Fossils were found but they are not abundant.

Spirifer sp.*Orthis* sp.*T. exigua**Actinopteria* cf. *boydi*June 18³

At about 1470' in stream below farmhouse thin grey shales with abundant *Camarotoechia* approx. the "congregata". These shells here are rather small, less than 1/2" wide. Other fossils are *C. mucronatus*, & *Crinoid* stems. Further up the bank there were no exposures. These shales may be the same as those exposed below the H. Quarry on the golf links.

Ludlowville

June 18⁵

Shale in road-bed, weathered and baled to grey color. These have abundant fossils and are of the same kind (shale) as that in the ravine.

S. pennatus c
P. emarginata
 Crinoid stems
T. carinatus c
S. granulatus
H. dehayi
M. concentrica c

Brachyzoa
C. obolus
S. cf. demissa -
 coarse plications
P. flabellum
S. per plana
T. carinatus

This outcrop occurs at about 1735'

June 18⁶

At about 1560-80' an outcrop of rock about 20' vertical. The rock is a hard sand forming the flat in the valley. The exposure is about 10' vertical. The lower stone breaks into thin slabs.

P. flabellum
T. carinatus

W.D

A small exposure on the SW side of the ravine shows the slabby nature of the rock when weathered.

June 18th ?

Small exposure in ravine of shales
belonging to the Sym. quarry horizon
Fossils are numerous

Taonurus
N. arguta
S. crotalum
M. mytiloides
Spinifer cf. granulorum
L. macroptera
P. flabellum
A. princeps
L. obsoleta

A. cora
P. emarginata
C. congregata
Cystolites sp.

Much of the rock in this outcrop is
in the form of huge blocks but they
must be in place as they are too
huge to have been moved by man. *L.*
obsoleta and *P. flabellum* in the stream-
bed, however, make this a sure horizon.
The outcrop is about 8' vertical and is
at about 1490-1500'. It does not
represent the very top of the Sym. quarry

June 18th

About 3' of hard ss. on which rest
about 4' of black shale. This sequence
was also seen at J 173. No fossils were
seen in either rock. The shale could
be seen in the road gully to the top of the
hill and here are about 15' thick.

Lower Ludlowville

June 20th

Shales in road on way from
Morrisville to Cayuga. The shale
is typically blue grey in cross-section
and fossils appear to be abundant.

A. umbonata
S. pennatus c.

Taonurus
T. carinatus

Bryozoa

P. constructa

H. delavayi

N. bellistriata

Pteris sp.

Grammysia cf. arcuata

Crinulopacten sp.

M. mytiloides

P. rana

R. vanuxemi

S. perplana

C. bellistriata

A. coral

C. scitulus

T. submarginata

Camastoechia sp.

N. corbuliformis

Cran. lam.

M. pygmaea

S. chelungensis

The shale on weathered parting surfaces
is a purple in color. In some places the
rock contains small black concretions.
Stone in the bottom of the exposure is
massive, somewhat calcareous &
does not easily split.

About 10' vertically from the bottom
of the formation fossils become rarer
but *S. pennatus* still persists.

N. oblongatus

Leuchitella cf. arcuata

R. fimbriatus

B. lida

Productella sp.

M. concentrica

A. reticularis in

a hard calcareous (?)

ss. (Probably loose ss.)

1929

In places in the last 5' of the 15'
of rock exposed were noted hard ss
bands, about 2 of them one about 6-8"
thick the other thinner. The lowest
band was only exposed on its upper surface.

June 19 Rain

June 20¹

A short distance (50') from road intersection are outcrops of shale weathered to an olive green and containing very few fossils. *Camarotoechia* sp. *Nucula* sp. *Leiopteria* sp. *Nuculites* sp. *Orthoceras* sp. *P. concentrica*

20' above road intersection in stream gully was noted a boulder of ss. with *P. flabellum*, many snails, *P. emarginata*, *M. concentrica*, *Camarotoechia*, *C. mucronatus* representing some of the assemblage & the lithology of the rock found in Electric light stream.

June 20²

38' above road intersection is hard rock in which fossils have become abundant. This rock appears sandy and when fresh is probably somewhat calcareous. Fossils noted here are *P. flabellum*, a corals, *Camarotoechia* sp., *S. pennatus*, *C. coronatus*, *N. bellistrata*, *R. vanuxemi*

June 20³

Outcrops in small gully behind farmhouse ^{of S.E. Palmer}. About 20-25' of shale like that of June 20¹ is exposed with an occasional band of exceedingly hard sandy stone.

g 20³

5' 2' sh.
ss 2'
crusts

76' ± Silty shale

10" 10" hard brownish gray ss.
5' shale

Fuller's Hill

833

833

June 20th

Rock at brow of hill in road gutter shows glacial striae

N 34 E

N 34 E

N 43 E

The rock is a blue-grey shale with fossils

S. pennatus

C. boothii

S. perplana

M. concentrica

Tasmanus

Aviculopecten

P. flabellum

L. laura ?

June 20th

About 1650' dark shales with some sandstone bands. Fossils are sparse

Liagula sp.

Productella

Leptodesma ? possibly a *Lepteria*. The exposure is about 10' - 15' vertical in a brook and along its banks.

Another similar exposure is found a little higher up to the south.

June 20⁵

Shale in stream flowing west ~~to~~ Nelson containing abundant *L. laura* and *L. pennatus*. The shales are only exposed for a short. ~~The~~ interval the rock in the bottom of ~~which~~ the exposure is very resistant to the hammer.

June 20⁶

7-8" of dark blue to black shale that crumbles into small fragments. A section of a small piece of this shale shows thin laminae. This outcrop occurs at about the 1700' contour.

Fauna

C. bellictrata

L. laura

C. scitulus

Canarotocchia sp.

Ludlowville *Prodictella* sp.

Within the dark shales are harder arenaceous bands. Fossils are quite rare in this rock and the exposure as a whole. The same rock runs almost to the top of the hill to about 1745 or 1750'.

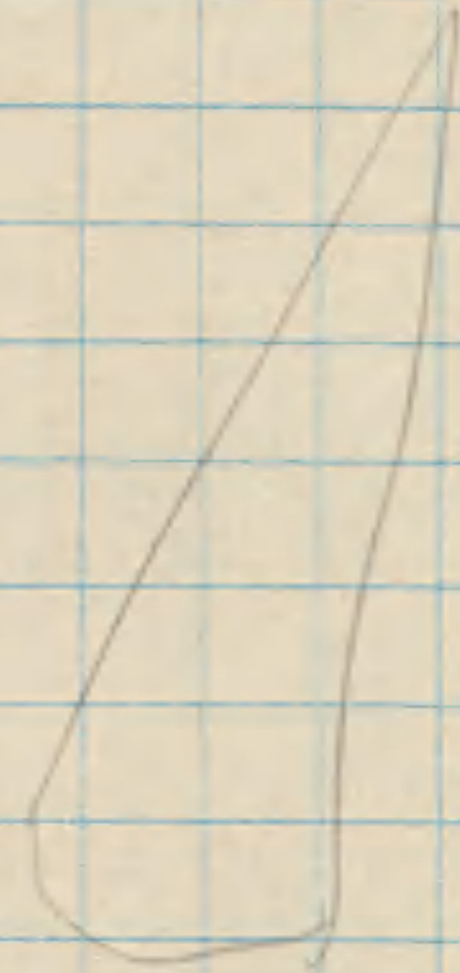
834

834

June 20⁹

Delphi

Small exposure of blue crumbly shales
in the back of Callahan Brook. The rock
is abundantly fossiliferous. Here are found

*H. micula**P. potulus**Lophanilloites**P. concentricus**H. acilis**Camartocchia**T. submarginata**Oriculopecten* sp.*M. subalata**Trepaspira rotaria**H. delavayi*

June 20th 10

Magnificent section of Chases' Glen
& New Gym rocks. The section is about
60' thick and the top of the New Gym horizon
is at about 1460' AT. At 1465' is a small
outcrop of soft, fissile black sh. which
breaks into flat chips. The Typical Gym
horizon appears at about 21' from the
top. After the gym horizon comes the soft
black sh.

At 1470' dark sh. but appears slightly
more massive as they break into larger
slabs. It is probably that the appearance
of these is due to their protection from
the sun.

Fossils-

Nucula corbuliformis

Spirifer common at 1476'

1481' an excellent exposure at least 20'
high with slabby ss. at the top.

At 1497' the rock is a hard slabby
sandstone which forms a fall
about 15-20' high.

At 1519' the hard sandy stone gives
way to a more shaly rock with

S. perratus

M. pygmaea

M. multicauda

Productella sp.

C. scitulus

This sequence also occurs in
Dunster ravine but is not so well
shown. Excellent for zoning interval
between ^{the} Quarry & Fertile and Sticks Farm
horizon. To be collected again.

This is just west of yellow farmhouse at road inter-
section.

June 20th

A similar exposure to f. 20th but not
as well exposed

ps
H
B.

June 21¹

Small outcrop of bluish shale, soft and argillaceous. In fracture section it is less bluish but a very dark greenish grey. Fossils noted here are

*A. umbonata**A. carinatus**C. mucronatus*

Large brachiozoans

C. scitulus

Crinoid stems

The shale crumbles to bits easily under the hammer. These shales belong either to the Cardiff or to the Pecksport sh.

June 21²

Small ravine near deserted house and road with bluish shales exposed for about 25'.

June 21³

In old deserted road by unused farmhouse several exposures of shale occur at about 1380' and higher.

At 1380 is a small exposure with

Camastoechia sp.*Lox. hamiltoniae**N. oblongatus**Orthoceras* sp.

Ostracoda

Shales same also at 1390

A. umbonata

At about 1406' the rock is more massive and does not split into the small fragments as below. The fossils yielded in the interval between 1406 and 1413' are as follows.

*Loxonema hamiltoniae**H. deKayi**f. M. subulata**G. lirata**C. scitulus**J. submarginata**cf. B. sulcomarginata**P. patulus**N. oblongatus**P. lirata**cf. A. erichsoni*

June 20³ cont

Interval between 1413-1418

Comarotoechia sp. cc*H. dehayi**Aviculopecten* sp.*C. tenuistriata**M. oblongatus**C. congregata* probably cc.The shales in this interval seem of
strongly of the *Gym* horizon

1418-1424' -

*Brachiomarginata**Comarotoechia**I. subemarg.**M. macrostomus**C. boothi**H. dehayi**L. londa*

1424-1430 - still coarse sh. with

P. flabellum (loose) Plant stems*Taenurus**A. boydi**Aviculopecten**C. tenuistriata**Leptæna* sp.

Interval 1441-1450'

Very coarse shales

*A. princeps**Cyclorema* sp.*S. cratellum**M. mytiloides**S. granulosa**S. punctatum**N. arguta**M. concentrica**L. obsoleta**P. flabellum**G. hamiltonensis*

This horizon appears to be about the New Gyn, near the top. To correct elevations distribute 25' among those cited. The top of this gyn horizon is only about 5' below ~~top~~ of hilltop and this accords with observations across the valley. This hard rock has caused the flat hilltop hereabout.

June 21st

Outcrops observed across valley on hill at level of about ~~1460~~ 1470-1490.

June 21st

Another outcrop of Gyn Quarry stuff at about 1475-1480'. This does not represent the exact top.

Starting at bottom of ravine at about 1310' are shales with

A. umbonata

Tacnigou sp.

S. pennatus

C. scitulus

M. concentrica

T. omnes

Shale here is exposed for about 8'. In texture and manner of fracture this shale is like that of the shale below the New Gyn horizon.

13-19-1321' - soft shales with *S. pennatus*
C. scitulus

At 1320' is a band in which large *Spirifers*, *S. pennatus* are very abundant. The band is calcareous. Crinoid stems abound here too. A few snails & *M. arguta* are also found here.

1321-1326 - soft bluish shales on the surface which are brittle and break into irregular flakes of large dimension. They are bluish in fractured section also. What appear to be a *Liorhynchus* and *S. truncata* are found here between 1321 & 1326.

1331-1336' the shale is characterized by abundance of *Strophalosia* & peculiar concretions. There were noticed also *H. triquetra* & *C. umbonata*. *S. pinnatus* appears to have disappeared at least in abundance.

At 1343 *Ambocoelia* is small but very abundant. *C. mucronatus* & *H. triquetra* were also noted here.

1343-1354' hiatus

1354'-1359' - the rock is much harder here, probably containing lime. Fossils are 'scarce' - *C. scitulus* in the bed of the stream some of the weathering forms are spherical and indeed all of the rock shows rounded weathered edges.

1359-1365 - same as above but two snails were found and a specimen of *H. deSoyi* was noted.

1365-1376 - Practically no fossils.

1376-1387 - The rock remains hard and fossils are difficult to discover. At about 1385 or 87' is a hard calcareous band made up almost completely of fossils.

H. deSoyi c.

P. rana

C. boothi

Platyceras

Spilifer

G. ethyris sculptilis

P. flabellum

C. indenta

C. elongata

Doniochorda

Camerozouidia

Actinopteria

On top of this band with its many fossils is a soft shale with an abundant fauna.

In the soft shales are

M. concentrica

P. flabellum

N. arguta

J. carinatus

S. perplana

Goniophora sp.

A. princeps

C. micronatus

H. dekeyi

Spirifer sp.

M. oblongatus

Leiopteria sp.

Edmonisia sp.

Productella cf. *spina*.

The deserted house at the abandoned road is on these ls.

1510
1439

73

June 22

Rain

June 23¹

Small exposures of soft crumbly Pecksport shales like those in the lower part of the ravine of 21⁵.

June 23²⁺³

Ravine opposite C. O. Daugherty's residence. The first rock exposure is at about 1380' and is a rather soft shale with *S. perrinites*, *P. flabellum*, *C. scintillus*, gastropods, *Hemiophiura* sp., *Spisifer* sp. At 1380' the shale is soft, but only slightly exposed.

1385 - *Amboecia umbonata* is quite common.

From 1402' up the shales are better exposed. *H. oblongatus* was observed here. At 1437' the shales are very fossiliferous with *Cammatrochias*, *Spisifers*, *M. concentrica*, *Productella*, *P. lirata*, *P. flabellum*, *Grainmurens*, etc. These are exposed 69' from first or lower rock exposure. They represent the shale lying on ls. as in J. 21⁵ but only a small amt. of calcareous stone was observed here at about 60' from base of exposure.

June 23³

Harder rock this is almost at the top of the New Hym horizon as exposed at New Hym. J. 23⁴ same as above. Lower layers with large *Pelagia*. There is here only a small exposure at about 1500-1510'.

J. 23² cont.

The Gyrus quarry horizon is at about 1510'. At 1365' that is 5' lower than rock noted as lowest before is an exposure almost unnoted. This contains fossils as follows. *Spyroceras* sp.

C. scitulus

P. flabellum

Large *Spinifer*

M. concentrica

S. pennatus

J. 23⁵

Small exposure of dark-blue crumbly shales with *L. laura*. When exposed to the weather these crumble to small fragments.

June 23⁶

Ravine on property of L. G. Brooks. At about 1380' soft dark shale, crumbling readily under the hammer. 2' above these soft shales is a band composed of larger fossils with *M. arguta*, *Orthis*ids, some *Pelecypods* but most 'noticeably' many *Spinifers*. 25' above this is a hard shaly stone, resistant to the hammer. The stone continues noticeably harder till 50' from bottom ~~there is~~ a 6" layer of blue ls. like the Tully. This ls. is exposed at about 1430'. Mottville

Shale on this ls. has *Productella*, *Spinifer*, *Astrorhynchia*, *Camerothecium* etc. *G. cuneatus*, *Orthis* *fasciata*.

June 23⁷

In a small draw shales are exposed like those of J. 21⁵. Above these and at about 1420 is a blue ls. which forms a flat between the hills.

Mottville

June 23⁸

Along road from Eaton to Mottville a small outcrop of Gyrin Quarry rock. The highest at the house is very near to the top.

Onida Creek.

844

844

June 24¹

Along flat-topped hill in road are found on the west side of the road somewhat arenaceous shales with practically no fossils. The only ones observed are *N. triguter* and *Orthoceras* sp.

June 24²

About 1460' in road slabby sandstones, gray-blue in color bearing *Tentaculites* and *N. arguta*. These continue for about 10' over a small rise in the road. On the downhill slope of the rise going west the same rock is exposed again but here fossils are seen to better advantage. Those noticed in the ss. are *I. exigua*, *C. recurva*, *P. flabellum*, *C. boothi*, *A. cf. cora*, *E. lincklaeni*,

At about 1470' a blue shale with many fossils has replaced the sandstones. Here we find

C. boothi

C. mucronatus

S. permatus? cc

Chaetetes sp.

C. satulus

P. constructa

Softer shales, which are quite fissile, are found about half-way between this horizon and the shales noted on the brow of the hill along the road.

About 20' should be added to the above elevations to make them in accord with those in the stream.

June 24³

- ★ 1390' ? Bluish shales of the Gyn Anany
 kind with characteristic fossils
A. decussata
A. fasciculatus
Productella spm.

At about 1410' there is a 15' cascade
 of rock composed of the more sandy
 layers found at the New Gyn horizon.
 This is very near the top of the New Gyn.
 At about 1427' the New Gyn horizon
 has hard ls. lenses or bands with
C. coronatus in abundance and on
 these are sandy stone. Besides *C. coronatus*
 are *P. flabellum*, *Strophodontas*, *Leiopteria*,
Actinopteria and *Atrypa reticularis*.
 These hard calc. bands rocks, with some
 interbedded shales are exposed up to about
 1435-1438' when they give way to a
 soft, fissile (?) black shale.
 These soft shales continue to about the
 middle of the second cascade where
 they become harder and then at about
 1488' the 8 Q (Fertiland stock farm horizon)
 has taken their place. This ends at
 about 1488' and forms a flat in the
 stream bed.

This is the best section seen of
 these particular rocks and should be
 revisited for zoning.

1451' *Leiopteria*, *truncata*, the shales here
 are like those along the road from
 Morrisville to Cazenovia, weathering
 purple.

At 1467' the ~~sandy~~ shales (bluish) give way to the sandy stone containing calcareous lenses. This sandy stone from 1467-1488 contains

<i>M. arguta</i>	} shale just (2') below 1st. ss. ledge.
<i>P. flabellum</i>	
<i>Camero-stoechia</i> sp.	
<i>Macrochilus macrostomus</i>	
<i>Chonetes cf. mucronatus</i>	

At 1477' there are large spherical concretions in the ss. and also ls. lenses.

Above the last falls and at about 1490' are bluish shales, an exposure of 31. containing

M. mytiloides
S. granulosa
M. arguta
P. flabellum
S. pennatus
Ethyris cf. cora
M. concentrica
Chonetes
S. perplanus
H. delongi

Along stream bed at about 1500' is exposed an exposure of ^{15' vertical} exceedingly fissile shale which breaks into thin flakes. Here are noted especially *L. laura*? *S. pennatus* *A. subornata*. This shale is exposed on the west bank of the stream nearly to the level of the road, but at that level it is somewhat sandy. The exposure is about 40' vertical.

June 24⁴

A small exposure 10' of weathered fine-grained sandstones. No fossils were observed in them.

J24.⁵ On the main stream rock is exposed intermittently for at least $\frac{3}{8}$ ' and is predominantly a sandy shale or slabby ss. No fossils have been noted.

June 24⁶

Just south of the road is a small escarpment of grey silt-shales. Fossils here are not abundant but there were noted

P. lista

S. pennatus

P. rana

Chonetes cf. scitulus

L. laura

N. triquetra

This rock is exposed for about 20' below the road. In the lowest layers *J. submarginata* was found.

June 24⁷

About 10' of bluish shales in which *L. laura* is abundant. *S. perplana* and *C. mucronatus*, and an *Aviculapecten* were also noted. The lowest exposure here is at about 1600'.

1605' *P. rana*

1621' *P. flabellum*

¹⁶⁴⁰₃₀ The large *L. lauras* continue for about this and for about 10-15' sandy stone is exposed that does not have abundance of fossils, ~~as these are exposed~~ These are exposed for 10 or 15'.

The above holds for the southern of the two ravines

$$\begin{array}{r} 1428 \\ 42 \\ \hline 1490 \\ 1120 \\ \hline 350 \end{array}$$

7

$$\begin{array}{r} 1670^1 \\ 1500 \\ \hline (170) \end{array}$$

In the northern ravine the road continues where that of the south leaves off and here as one progresses up the slope in the stream gully the stone becomes a sandstone with ~~members of~~ *P. flabellum* in it. The stone on the very top of the hill has much *Taonurus* in it. Outcrops run up to about 1678'. The sandstones probably belong in the H. Quarry.

The uppermost stone has many fossils

D. sculptilis

S. perplana

Fenestellids

One of the *Pterinidae*

S. divaricatus

Denticulite (small)

T. carinatus

R. fimbriata

S. munitum

A sandy sh. member in the ss. has *A. erectum*. This upper layer (1680') is entirely unknown to me before

June 24⁸

Hard arenaceous shale rock exposed in the road gutter for about 10' vertically. There is a great abundance of *P. flabellum* in this rock. Other fossils are

A. boydi

M. concentrica

Macrocheilus sp.

T. carinatus

S. chenuingensis

A. fasciculatus

Goniophora sp.

C. tenuistriata

C. congregata

C. coronatus

Taonurus

C. elongata

A. erectum

This horizon has the appearance of the Gyn quarry but *Spinifer perinatus* in the debris about the outcrops suggests that it belongs here and in that case this is not the New York horizon

A little higher up about 10' vertical
the same kind of rock is seen with
Strophodonts, *A. fasciculatus*, *A. boydi*,
A. erectum.

June 24th

Belden farm.

Weathered shales that crumble
to irregular large fragments. These
contain

H. debay

Camantocchia sp.

June 24th Between ~~1540-1560~~¹⁵⁴⁰⁻¹⁵⁶⁰ occur rocks near the top
of the New Lynn horizon

June 24th

Near top of New Lynn horizon in
and along stream. Almost at top as it
has its topmost bed with *C. coronatus*
and *A. boydi* in abundance

At about ~~1560-1580~~¹⁵⁶⁰⁻¹⁵⁸⁰ a shale is encountered
which contained a *Merula*, this must be
the shale above the New Lynn at a point
where it is becoming massive. Many
small outcrops were noted below but
not mapped. They occur between

June 25'

At about 1470' shales referred to the New Hym horizon are encountered. Intermittent outcrops are found up the hill to about 1505' or 1510'. The topmost outcrops are of grey silty sediments probably greatly weathered. These contained *M. arguta*, *l. cf. granulosa*.

Between 1460' and 1470' rock is found that is referred to the New Hym horizon. *T. chaletii* was found in these lower rocks. Probably all of the rock exposed here is referable to the New Hym horizon altho the topmost layers may rest above it. A fragment of a slab of calcarenite stone with many *C. coronatus* was found in the debris about the exposures at about 1490'.

In the stream about 36'-40' of rock are exposed and the top of the calcarenite is at about 1500-1510'. This is also the top of the New Hym horizon. About 20' above this is a soft shale in the stream with many *Liptonella*, *Camerozoechia*, *Orthoceras* sp. and *C. coronatus* in abundance, ~~*M. macrostoma*~~, *M. macrostoma*.

Above these exposures no more are seen in this stream. A marsh however occupies the flat between the hills and this is probably caused by the Fertile (Stock Farm) (Electric Light stream) sands.

In a small gully running west from the main brook are exposed shales which are soft and break into chips. These are exposed almost continuously up to 1660'.

At about 1680' the shales are bluish and contain *L. laura* ^(very large). Between 1660 and 1680 they were becoming harder but had no fossils.

The shales at 1680(?) are decidedly blue when weathered and break into small blocky fragments. Here was noted besides *L. laura*,

C. boothi *S. pennatus*
C. scutellus
S. arctostriata

At 1820' the stone is distinctly sandy and ~~the~~ it weathers into flat slabs. All of these high hills have only Hamilton rock in them. On the highest portion of this hill there is glacial debris - ~~loose~~ till.

Two ravines indicated as existing north of June 25' run thru glacial material which is here very thick.

at about 1500'

June 25³.

Calcareous arenaceous ss. representing the very top of the New Syn horizon. Here *C. corollatus* is found in so large abundance as to almost make up the entire stone. With this fossil are found

A. reticularis *Spirifer* sp.

A. boydi

A. cora

P. flabellum

Cinn. elongata

Located just East of the
 "Little Valley stock farm"

This band is about a foot thick, above it is 1' of ^{calcareous} sandy rock with
T. carinatus, *Cornella* ~~lance~~, *Spirifer* sp., *S. perplan*
S. spigeros

852

852

June 25th

About 1425-1430' blue shales of Eaton
(lower) below Gyp horizon with
Pentamerus, *Lophonema* etc.

Brachiopoda

Ambocoelia umbonata c
Tropidoleptus carinatus
Schuchertella chemungensis
Cyrtina hamiltonensis
Spirifer granuloser.
Reticularia fimbriata
Schuchertella perversa
Rhipidomella cyclos
Athyris spiniferoides
Atrypa reticularis
Orbiculoides doria
Cranella hamiltoniae
Chonetes scitulus
C. mucronatus
Rhipidomella varunxemi

Pelecypoda

Palaeoneilo maxima
Orthonota carinata
Modiomorpha mytiloides
Plethomytilus oviformis
Sphenotus archaeiformis
Phthoria cylindrica
Sphenotus euneatus
Nucula varicosa
Grammysia obsoleta
Leda rostellata
Nucula lamellata
Cunitaria elongata
Nuculites triquetus
Nucula corbuliformis
Grammysia constructa
Orthonota undulata
Actinopteria decussata
Palaeoneilo plana
Nucula lirata
Cunitaria recurva
Modiomorpha concentrica

Palaeoneilo nuda
Cypriardella bellistriata c
Pholadella radiata c
Palaeoneilo constricta
Orthonota parvula
Muscula bellistriata
Modiella pygmaea
Cypriocardium indenta
Cypriardella tenuistriata
Palaeoneilo emarginata
Prothyris lanceolata
Murchites oblongatus
Parallelodon Hamiltoniae
Tellinopsis subemarginata

Gastropoda

Coleolus terminatus
Hyalithes aelis
Stomatia patulus
Hyalithes striatus
Buccanopsis leda
Eurygonia itys

Aphalopoda

Orthoceras sp.
Pardiceras discordium

Crustacea

Echinocaris punctata
Phacops rana cc
Cyphacis boothi
Homalonotus dekeyi

Isopods

Crinidea

Gilbertocrinus spinigerus (Hall)
Poteriocrinus cf. *diffusus* Hall.

855

855

Red Gate

Contact

Quite regular, and lithologically very abrupt, the bluish crumbly shales being in strong contrast to the hard crinoidal stone. However crinoid remains are exceedingly abundant in the blue shale. In the shale just on top of the ls. occurs a layer of shale containing many crinoid stem segments and a few corals.

Fauna of 1st foot $\frac{1}{2}$ of blue sh.

Leda

Camarotoechia CC

R. vanuxemi CC

D. sculptilis

Actinopteria

f. 30.

Coarse blue grey shales thrown out from the excavation for the new water-tower. The most abundant fossil is *Leiorhynchus*, but it is not profuse. The rock here is much grooved by the glaciers and exists as a gently sloping bench, the surface of which is marked by the N.E. SW trending joints.

Unsorted glacial drift here is from 7-10' in thickness. It is deeper toward the west where the rock plunges under it.

July 1st

A very small outcrop of shale in the road gully. The rock is soft and fissile crumbling very readily under the hammer or in the hand. The color on the surfaces of the pieces is a purplish brown but in fracture is an olive grey. Fossils are very rare in this small exposure and only one, *Asterorhynchus* was found. Many of the surfaces of the naturally fractured pieces are curved and some show splitting along the bedding break with very uneven surfaces. *Crinoid* stem. Probably Cardiff. This outcrop is at about 1285'

July 1st

In a dry stream course a few patches of black shale chips were seen, notably about a woodchuck's hole, indicating *Marcellus*.

July 1st

Small ravine with intermittent exposures of dark shales between 1230-1260'. The shale from a woodchuck burrow at about 1270-1280' is a brownish grey. It most certainly is not black and may represent the Cardiff division. The shale below at about 1260-70 appears darker and more fissile.

July 1st

About 1265' shales blue on surface but olive in fracture where weathered.

858

Onondaga Creek

858

July 1st

1110' - lower Onondaga, light grey
x-ls. with cup corals. West along the
road no exposures were found.
Glacial debris comes as high as 1240'
and evidence ^{at} show that it covers
the hill.

July 16 & 17

Shale chips along road suggest
that Cardiff may be in gullies.

July 1st

Ravine behind Wrights.

1130' black, thinly laminated fissile
shales.

1145' the shales are becoming more
massive & 1160' the rock for 130 or 4' is
quite hard breaking into massive irregular
flat blocks. At 1170' the shale is fissile
where weathered. The shales from 1145'
up have been a very dark grey in color,
not the jet-black of the Marcellus. The
Cardiff may be in these upper shales.
These shales are exposed up to the 1200'
contour. The upper ones are certainly
olive in color. Fossils are practically
absent.

July 1⁹

About 1100' black shales exposed in the hillside. These are very thinly laminated and break into flakes thin as paper. in section they are jet black. They also show an external rust that is rich red-brown.

July 1¹⁰

1120' Marcellus shales, fissile paper thin in fineness of lamination. Some of the laminae are thickly coated with rust. At about 1187' there is a sharp change in the color and kind of rock. The thinly laminated jet black gives way to a dull olive-colored rock which has septaria at about 1172'.

July 1¹¹

Between 1170'-1175' the shale becomes olive in a second draw about 100 yds from Jy 1¹⁰. In a gully between these Marcellus was followed up to 1166' when all rocks ceased to be exposed.

July 1¹²

Fourth gully from July 1¹⁰. Cardiff comes in between 1170-1175'. At 1170' were noted small nodular concretions in abundance.

5th gully from Jy 1¹⁰ Cardiff comes in at 1170 or 13th hand-level-step.

Note - West along Orinda Creek the material is glacial. Many springs along base of hills on both sides of valley have deposited calcareous tufa.

Lake Moraine - July 2 - afternoon

In the first 5,5" of shale all fossils are quite rare and the symbols must be taken to show the proportions. *A. umbonata* far outweighs all other fossils.

- ✓ *I. carinatus* \approx
- H. dekanji* \approx
- ✓ *A. umbonata* \approx
- ✓ *A. large snail, possibly 2 kinds* \approx
- N. triquetra*
- Bryozoa* \approx
- L. rogersi* \approx \approx
- M. pygmaea* \approx

Lithologically, the rock is composed of hard and soft shale, the fossils occurring mostly in the latter. The slab is intimately mixed with the harder rock, which may be somewhat calcareous. When weathered the rock splits readily where shaley into flattish slabs.

2nd 5,5" -

- C. scutellus* A
- M. subalata* \approx
- M. pygmaea* \approx
- Palaeoneilo* sp. \approx
- Drammipia* sp. \approx
- Camarotoechia* sp. \approx

at about 6' from base of outcrop the *Ambocoelia* drop out and give way to *C. scutellus* in large number. This fossil is more abundant than *Ambocoelia* was. The lithology continues to be the same. At about 10' *Ambocoelia*

begin to come in, together with *P. liata*
+ *Grimmia*.

Next 5' 5" + 2' —

<i>Camarotoechia</i>	A
<i>T. comatus</i>	C
<i>S. pennatus</i>	r
<i>H. delavayi</i>	re
<i>Spirifer</i> sp.	r
<i>S. perplana</i>	r.

In the upper beds *C. scutellus* has
dropped out and *Camarotoechia* become
the abundant fossils.

Jy 5' Lebanon

Sandy stone in road gully with some bluish shales, fossils are not numerous
I. carinata

^{of tellies}
C. small spinifer Some of the stone is like the Earlville sh., but others are true ss. This section of about 8' probably represents a horizon somewhat above Earlville sh.

In the gully at about 1400' a slab was found with

C. complanata
I. pennatus

August 29.

Quarry behind Barber House
Morrisville

This is a rather large exposure between 40 and 50 yards horizontally, and nearly 20' vertically. The lower portions for the lowest 8-12' are rather gritty shales with a distinctive fauna. These shales are also rather bluish and break into somewhat smaller fragments. There is an increasing amount of grit as one ascends toward the top and there the rock is quite sandy or silty. The rock weathers into small fragments but the pieces break off in a very irregular fashion into chunky fragments. Occasional concretions are encountered, the common kind being flat, irregular button-like calcareous masses weathering to a light brown silty material which lacks.

Fossils are preserved as interior moulds, interior casts, or exterior casts. The original shell in a mineralized form is rarely noted.

The lower beds for about the first 10 or 12' are characterized by snails, notably *Bellerophon*, *Bellerophon*, *Bellerophon*, and *Loxonema*, along with a *erectum* in casts. *Brachiopods* are not very common.

In the upper 8 or 10' *P. glabella*, *C. congregata*, *M. arguta* and *L. macrurum* and *D. obaneta* become rather common and then the upper part of the quarry represents the lower part of the *Argon* quarry at Hamilton.

Fossils from this exposure are:-

L = lower 80-100' U = upper 10-15'

<i>P. lirata</i>	u	
<i>N. elongatus</i>	L	
<i>Lingula</i> sp.	L	common
<i>N. truncatus</i>	u	
<i>P. flabellum</i>	u	middle
<i>A. castrum</i>	u	In the upper part very large
<i>O. dia</i>	L	
<i>C. boothi</i>	u	re
<i>C. tenuistriata</i>	m	
<i>P. patulus</i>	L-C	
<i>Leptena</i> sp.	u	
<i>Tentaculites</i>	large	
<i>S. mentum</i>	u	
<i>P. pinnulata</i>		
<i>P. pectent</i> sp.		
<i>L. obsoleta</i>	u	
<i>N. arguta</i>	u	
<i>Pholidops</i> larva (P. larva)		
<i>M. saccharatus</i> (P. larva)		
<i>A. princeps</i>		
<i>L. capillaria</i>		
<i>Cyrtolites</i>		
<i>P. constricta</i>	u	
<i>C. mucronatus</i>	u	
<i>C. vicinus</i>	u	
<i>L. Hamiltoniae</i>	L-C	
<i>Cyt. Hamiltonensis</i>	L	
<i>H. dekeri</i>	L-C	
<i>M. subulata</i>	L	
<i>M. pyramida</i>	L	
<i>P. l. ha</i> sp.	L	
<i>A. harte</i>	u	
<i>S. perplanus</i>	u	
<i>S. crotatum</i>	u	
<i>B. submarginata</i>	L-C	
<i>L. maculata</i>	u	
<i>P. sectifolius</i>	L+u	
<i>N. r. halli</i>	u	
<i>I. carinatus</i>		
<i>C. conqueata</i>	C-C	upper
<i>C. adithes</i>		
<i>A. fasciculatus</i>	u	
<i>P. marginata</i>	u	

866

866

Report of Crinoids sent
Miss Goldring - 1926, rec'd Apr. 14, 1927.

Locality	Name
New Lynn Quarry	cf. <i>Botryocrinus mystaceus</i> (Hall)
Georgetown-Lebanon line	<i>Botryocrinus obconicus</i> (Goldring)
Georgetown, N.Y. (7a F11)	<i>Hemiacocrinus euharis</i> (Hall) <i>Thamnocrinus springeri</i> Goldring
Georgetown, 7EC2	<i>Potriocrinus cf. diffusus</i> Hall <i>Gilbertocrinus spinigerus</i> (Hall)
Red Gate - lower shales	<i>Bucanopsalis leda</i>

Review on Stephen Wedge property now
owned by Fred Cather.

~~Weiner~~ Werner, William - Quarry
at Georgetown.
Mr. Werner also owns most of the
quarry here. Quarries exposed in
front of his house - stone for
road from Georgetown to Williams
taken from this quarry.

Sept 13²

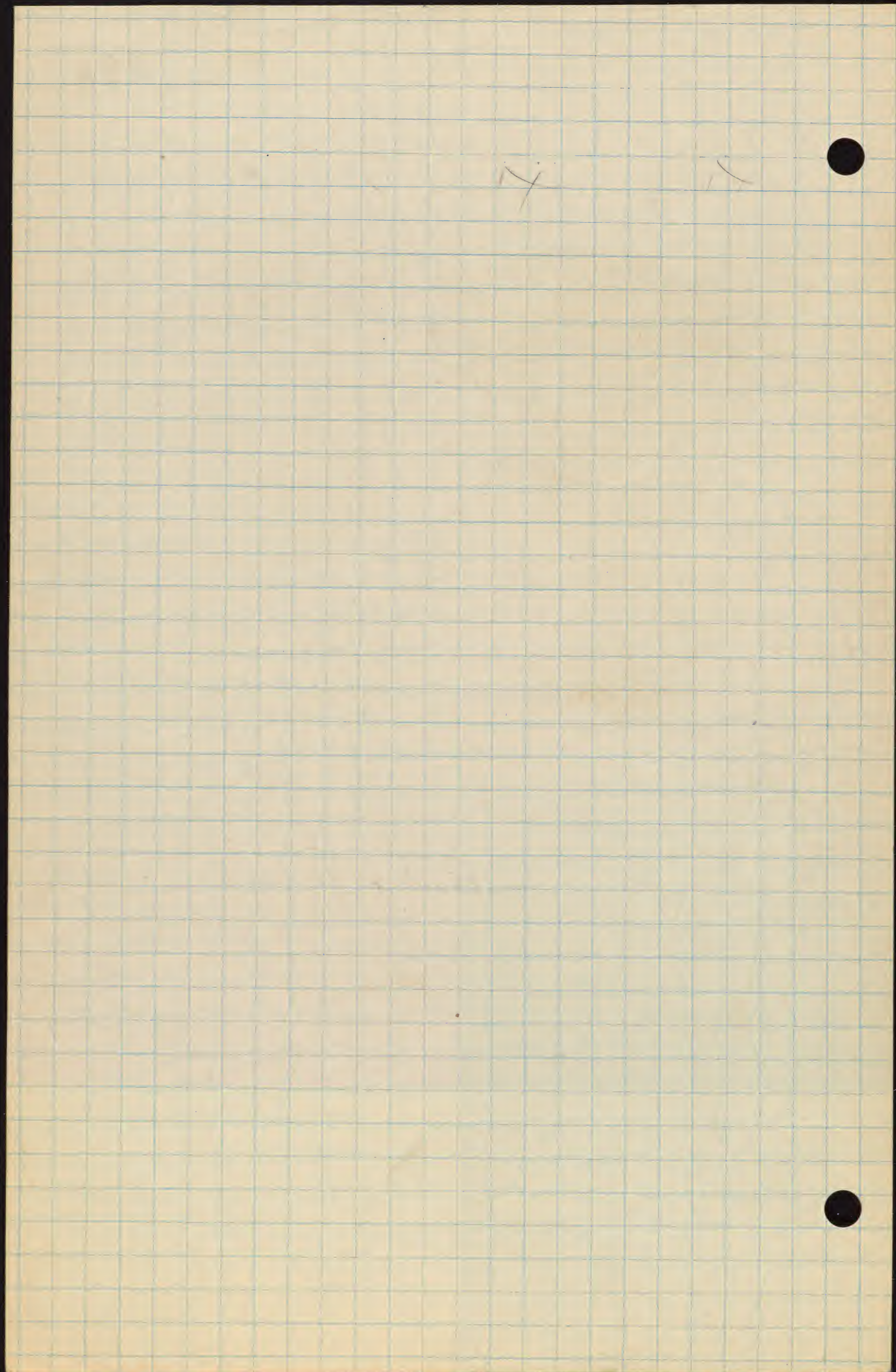
On top of hill on north side of ravine at about 1515' A.T. top of New Gym horizon (as exposed at New Gym). Here the sandy shales have been bleached to a light grey sandy stone. *L. obsoleta* & *M. nightbirds* were seen. This horizon is exposed at the head of the ravine about 10' below the deserted house west of the road intersection. This brings the top of the horizon at about 1515' A.T.

At the road intersection 1500' is also exposed an excellent outcrop of the rock. Fossils observed here are

<i>S. granulatus</i> (?)	<i>M. concentrica</i>
<i>L. obsoleta</i>	<i>R. grandis</i>
<i>G. truncata</i>	<i>B. sulcomarginata</i>
<i>A. decussata</i>	<i>C. congregata</i>
<i>A. boydi</i>	<i>N. arguta</i>
<i>P. flabellum</i>	<i>T. insignis</i>
{ <i>A. reticularis</i> at 1503 or 4'	<i>A. celsa</i>
	<i>G. orn. hamiltoni</i>

8-9' above the intersection, travelling south this horizon ends as a hard, resistant, calcareous, sandy rock. On the top layer here was seen *T. coninatus* c, *S. perslana*, *P. flabellum*, *C. boothi*.

The exposure on the north side of the ravine can be easily seen from the top of the exposure 8 or 9' above the road intersection. This gives a level sight when



standing on this exposure, hence its elevation is about 1514' A.T.

Top of New Gyrus horizon as exposed here does not have the layer with *C. coronatus* + *A. reticularis*, or else it is not exposed. The top is at 1509' and at the intersection about 20' of rock are exposed.

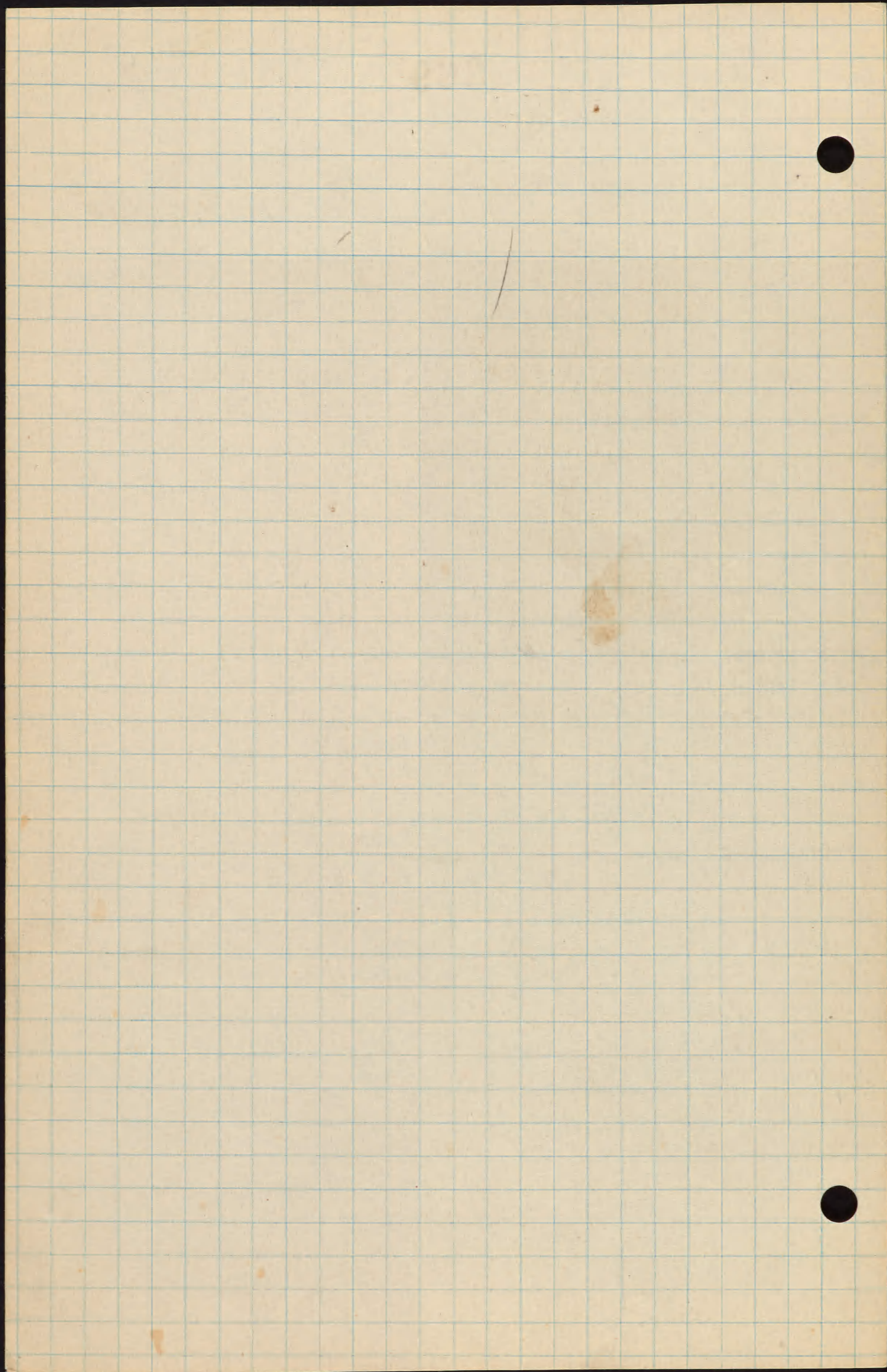
Going south

1509 - 1519' 10" - hiatus

1519' 10" - 1524' 15" - dark unfossiliferous shales in the road gully. These shales become sandier as progress is made up the hill to the south.

At 1559' 50" comes a slabby ss. At 1564' 55" is seen a coarse sandy shale abounding in *Nyassas*, *S. pennatus*, *C. superornatus*, etc. Just below this is a hard calcareous arenaceous rock with *S. pygmaea*, *S. pennatus*, *N. arguta*, *P. flabellum*, ^{R. Dammigini}. The horizon with the *Enchellus* was not seen. This was hand-levelled twice from the top of the ^{Delphi} horizon to the top of the ^{Pompey} horizon & gave 11 steps each time. Thus this interval is 59' 7" and is practically the same at Delphi Falls. A foot should be added to include the upper shales. Soft shales follow but are only intermittently exposed.

about 1590' a 2' exposure has *L. laura*.



Fossils here are *P. flabellum*,
H. dekeyi, *Camarotoechia* sp., *P. spinulicosta*
 30' above this exposure others are
 seen rimming the hill. These are
 very close to the top of the New Gym
 horizon, perhaps 60 or 20' below. The
 rock here at this level (1423') forms
 a distinct terrace or flat. ~~at the top of~~
~~the ninth step the rock is hard~~
~~and sandy forming a small~~
~~cascade. Here were seen:-~~

T. carinatus nc

A. princeps.

S. perplana nc

Schuchertella

S. andaculus

H. boydi

The rock is a limy sandstone?

Above the New Gym there is a hiatus
 of about 5' at this ravine about 5-5'
 off the New Gym rocks are shown

1610' A.T.

Sept 13³

Sandy shales or ss. without fossils

Sept 13⁴

A small exposure of dark grey
gitty or sandy sh. without fossils
This horizon must be near that
at the new water tower? 1640' A.T.

Sept 13⁵

Between 1680-1700 bleached sandstones
probably belonging to the University Quarry
horizon. The slope of the hill is
covered everywhere with these slabs.
These in the hillside facing south
at about 1690' but are only exposed
vertically for 1 or 2'. It is not improbable
that these rocks belong to the ss
exposed near Electric Light Brook
and between that place & the Cozenovia
road.

Sept 13⁶

A large exposure of the limestones
that exposed in Burchard's quarry.
Bottom of exposure at 1348'! About
75 or 76" in. of the sandy ls. are exposed.
The exposure is fully 100 yd. long.
On top of the ls. come soft shales.
Along the ridge of the hill 8 steps or
43' above the ls. are found sandy
shales that belong somewhere below
the gym horizon.

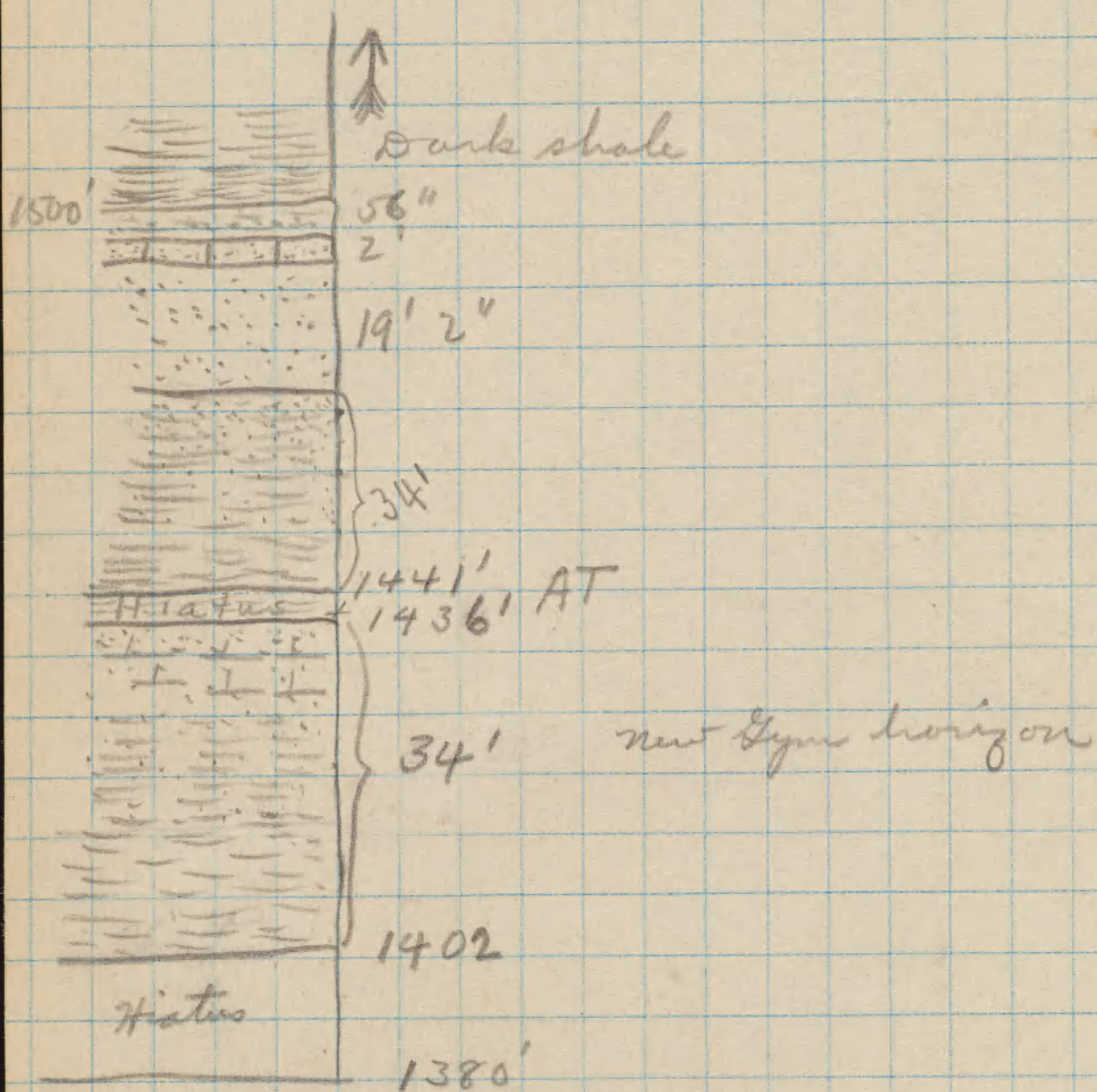
Onondaga Ck

Sept 14.

Hand-leveling begun at 1380' A.T.

The first rock in this ravine is seen at about the bottom or middle of the 4th step. It consists of sandy shales belonging at about the same horizon as the rocks behind the Barker House at Morrisville. The rocks become increasingly harder as they approach the top of the New-
Gyne horizon. There must be close to 20' of the very hard sandy rocks. When exposed in the woods these rocks are commonly an ash grey, being covered by lichens. The fracture of the rocks is very irregular. Large slabs may be wedged up but they have no definite shape, but are very irregular with one or two other surfaces \parallel to the bedding. The color is commonly a light grey, when exposed in the woods, or in the streams it is somewhat darker. In the open fields the rock on the fresh fracture is sometimes very light grey almost yellow white.

The top of the horizon is very resistant & commonly forms falls and cascades in the streams on ledges & ridges on the sides of hills. Tabular is very common in the upper portions but is not found commonly in the lower beds.



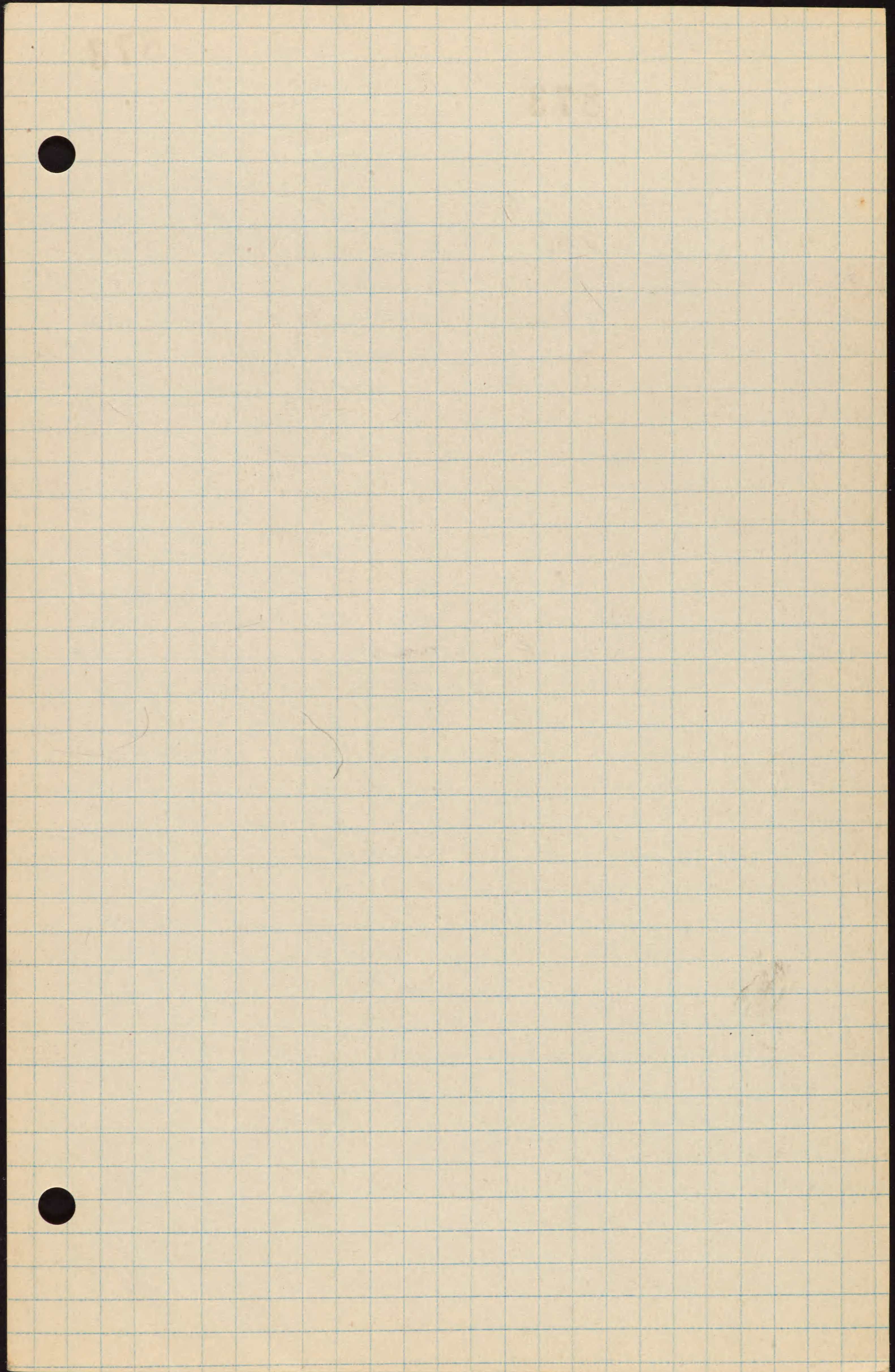
Each square 10'

At about 1427' A.T. comes the brink of the first cascade. This passes over rocks belonging almost at the top of the New Gyn. Above the cascade there are about 3' of rock exposed. The cascade is about 9 or 10' high and the stream passes for a short distance thru a gudge about 15' vertical.

Taonurus abounds at the top of the 8th step.

About 1' 5" below the 9th step there is a 3" band of calcareo-arenaceous rock bearing *C. coronatus* in great abundance and *A. cora* and *A. reticularis* in lesser amount. This band occurs at just about 1431' A.T. (In other notes 1427). Above this are exactly 5' of hard calcareo-arenaceous rock of the New Gyn horizon. *A. reticularis* was seen at the road intersection yesterday at just about 5' below the top of the New Gyn. This horizon with *A. reticularis* does not seem to be continuous as many horizons do not yield it. At the New Gyn *A. reticularis* was present but is very rare. Other fossils from this horizon are:—

- ✓ *P. flabellum*.
- ✓ *A. boydi*
- ✓ *I. perplana*
- B. subcomarginata*
- P. rana*
- M. concentrica*
- Pal. emarginata*
- Loph.*



The very top of the New Gyn here is a sandstone. About 1' from the top it is somewhat slabby. The transition into the black shales was not seen. At the top of 9th step the rock is hard and sandy forming a small cascade. Here were seen:

T. carinatus re

A. boydi

S. perpallana re

Taonurus re

Schuchertella

S. andaculus

Above the New Gyn, a hiatus of about 5'. At this ravine there is about 34' of New Gyn rock exposed.

The fauna of the dark shales is not very abundant and is a fauna of small Pelecypods. The shales when wet appear quite black. As one progresses vertically the animals become bigger as the rock becomes coarser and of a lighter grey.

21' above the top of the New Gyn the shale has become quite sandy and here were seen

A. Bellerophon

Orthoceras sp.

Large *Leiopteria*s

N. trigaster

Fossils from 1436' - 1451' 15" - see collection
 Fossils from 1451' 15" - 1458' 20" are
N. corbuliformis c *Macrocheilus* sp.
Lingula sp. *B. sulcomarginata*
Leptopteria sp.

1458' 20" - 1461' 25" - not favorable for
 collecting. *M. macrostomum*.

1461' 25" - 1466' 30" - *P. emarginata*,
 At the top of this step the rock is a
 coarse sandy shale: - *Leptopterias* sp.,
M. macrostomum, *N. triguter* at the
 top of this step there are '10-12" of
 ss and then the coarse shales are
 seen again. the sandstones are a lens.
 but 2½' above the sandy shale the
 sandstones come in to stay. The
 shales in the 2½' bring in a new fauna

1466' 30" - 1471' 35" - In the 2½' of sandy
 shales *N. arguta*, *P. flabellum*, *C.*
mucronatus, *Comarotoechias*,

1471' 35" - 1476' 40" - ss. large round
 concretion

1476' 40" - 1486' 50" + 2' - At 1486' 50" the
 ss which are slabby end, bringing to a
 close the horizon that originally
 carries lenses of *Enella* and
Macrocheilus. ss. lenses were not
 noted here. The ss begin at 1471 and
 continue to 1490' 2"; thus there are
 nearly 20' of sandstones.

On the sandstones are 2 1/2' of compact calcareous sandstone abounding in fossils:-

S. granulosa, re

S. perplana c

R. cora ? c

S. pennatus re

R. vanuxemi

At the top of the last falls the stream has produced a prominent flat. This upper bed is in 3 layers the bottom two contain *S. perplana*, *S. pennatus* & *R. vanuxemi*, these are diagnostic of this zone & mark the passage into the Ludlowville. I do not believe that the fauna of these upper layers can rightfully belong to the Skaneateles but must mark the incoming of new animals. *S. pennatus* & *R. vanuxemi* are not common the former not present in 100' or more of rock below.

On top of this rock comes 58" of sandy shale abounding fossils. In the lowest 6" the fossils are

✓ *S. granulosa*

X *N. arguta* c

Atthis sp.

✓ *S. pennatus*

R. serpens.

Modiomorpha large sp.

✓ *C. mucronatus* c

X *M. concentrica*

✓ *S. perplana*

Orthoceras sp.

In the 50" of coarse shale above this half foot are found

- | | |
|--------------------------|---------------------------|
| x <i>C. micronatus</i> c | <i>Orthoceras</i> sp. |
| x <i>S. pennatus</i> cc | x <i>A. umbonata</i> cc |
| x <i>S. granulatus</i> | x <i>C. scitulus</i> |
| x <i>M. niphthoides</i> | x <i>Speriplana</i> |
| <i>Aviculopecten</i> sp. | x <i>Pal. concentrica</i> |
| x <i>Leiopteria</i> sp. | <i>M. concentrica</i> |
| x <i>A. scabridus</i> | x <i>Atthis</i> sp. |
| <i>N. arguta</i> | x <i>G. arcuata</i> |
| | <i>Pterinopecten</i> |

About 150 paces upstream from the brink of the falls are seen closely jointed argillaceous ~~slaty~~ shales like the Genesee, about 15' vertical. The Niagara zone goes upstream for about 100 paces from the top of 1486' 30". These argillaceous dark shales must come at about 1500' A.T.

P. dioideum

A. umbonata

The shale in the stream bed at the bottom of the exposure is crowded with *L. laura*; *M. subulate*, *P. fragilis*, *S. truncata*, *M. pygmaea*, *Leiopteria* sp.

The upper part of the exposure is not very fossiliferous.

A. erectum seen in sandstones belonging to Fort. horizon.

Sept. 14. '27

Road from Morrisville Station to Morrisville

Railroad crosses highway at 1226' A.T.

1226' - 1236' 10" Blue grey shale chips and a few small exposures of rock in the west side of the road embankment. The shale is very blighty, gritty, when crunched in the teeth. This rock cannot be far above the Pine Woods hard band and is certainly very near the base of the Shalestones. On the slope at this interval fully 8' of chips and rock are exposed. The chips are rather chunky and very irregular, assuming no definite shape. The fauna is in my notes of last year.

1236' 10" - 1276' 30" - similar shales. One large exposure 100 paces long on the side hill where the rock is being quarried for road packing or for farm uses. This is an excellent exposure for collecting. The rock is the same as that at Peckaport and is about the same horizon. *L. laura* is very abundant and in places is found in swarms on the surface of slabs. The fossils are not well preserved however. The shale has some grit but is not a sandy shale. Fossils seen in a hasty survey are -

*M. pygmaea**L. laura**P. fragilis* n*D. subulatum*

40' soft
sh.

4' 8" { sandy sh.

2 1/2'

19' 2" { ss.

1486 30"
490

14' { sandy
sh.

7
11
30
5
61

16' Soft sh.

5' { Covered 1437' 35" (1440')

1476 6
1347
30

31
54

5' { 1436'
1432' 50" 20' 30" p.
Styopa reticulata

34' {

1427' 25"

1422' 20"

1440
1402
38

1417' 15"

1412' 10"

1407' 5"

1402'

828

828

*A. umbonata**Productella* etc

The *L. laura* here are not as large as those seen at Pecksport but are much more abundant as there may be 3 or 4 layers of them in a single bed of $\frac{1}{2}$ " thickness. Much of this shale breaks with a rounded or curved fracture. The slabs with a curved surface can only be broken with difficulty when attacked from the curved side, but split readily into flattish slabs when fracture from the side toward a joint plane. About 10' vertical are shown in the quarry but if the slope of the road is taken into consideration about 20-25' vertically may be studied.

When thoroughly weathered these rocks become a very light brown or olive color.

1276'50" - 1286'60" - same

1286'60" - 1291'65" - hiatus

1286'60" - 1296'70" - "

1296'70" - 1301'75" - here are exposed about 3' above 1301'75" - 6" - 9" of gritty shales breaking into small slabs. These contain *A. umbonata*, *C. scitulus*, *M. pygmaea*, & *L. laura* & *S. truncatus*.

1301'75" - 1306'80" - hiatus - at 1306'80" some shales with *A. umbonata*.

1306'80" - 1311'85" - chips of thin shale in bank, some in gutter.

1311'80" - 1316'90" - slugs & a few small exposures in the gully

1316' 90" - 1326' 100" - limest.

1326' 100" - 1331' 105" - "

1331' 105" - 1336' 110" - shale and thin layers of blue grey limestone weathering to a brownish, slightly sandy clay on exposure. The ls is lenticular in form and local in the sandy shale in which it is contained. Most of this rock weathers down into coarse irregular lumps, the color of which is yellow-grey or "olive". The ls. on weathering also chucks into irregular lumps. A markedly different fauna enters here at 1331' 100". It has

P. flabellum, *Spirifers*, ^{*Trinacrinus*} *Productella*, *Camarotoechia*
1336' 110" - 1343' 115" comes similar rock but increasingly arenaceous and chipping into heavy lumps. At the top of this interval was found a band of a few inches in thickness of blue grey sandy ls. abounding in fossils
Ammonopecten? sp. *H. dekeyri*
C. congregata *C. coronatus*
S. andaluticus?

This rock has the appearance of that at Burchard's Quarry, and was my former horizon between the Skaneateles & Tullyville.

Occasional layers of light brown, (weathered) shale are seen between the heavier - calcareous - arenaceous bands.

At 1343' 115" - heavy calcareous - sandy rock is seen which is glacially scored. This is just in front of the first house (white) on the south side of the road as one goes west up the hill.

The road has apparently been altered here, a matter of about 10' vertically + 30' horizontally. This white house used to be on the road but is now a considerable way back. The present Morrisville road is only a short distance north of the former one, traces of which can easily be seen.

1343' 115" - 1346' 125" - hiatus

1346' 125" - 1351' 125" - " North of the road in front of this house the hill flattens out, probably due to the hard layer.

1351' 125" - 1406' 180" - hiatus

1406' 180" - 1411' 185" - In a gutter under the road - coarse - calcareous - arenaceous rocks with *P. flabellum*. This horizon is actually just at about the top of 1406' 180".

1411' 185" - 1416' 190" - similar rocks but impossible to collect.

1416' 190" - 1421' 195" - same with *S. perplana*, *P. flabellum*, *N. arguta*

1421' 195" - 1426' 200" - rock in place but loose slabs here abundant in *A. boydi*. Also *S. perplana*, *A. princeps*, *P. lirata*, *M. concentrica*, *S. andersoni*?

● 1426' 100" - 1431' 205" - *C. congregata*,
L. obsoleta, *Spizella*^{day}, *H. arguta*, *A. cora*
 At the top of 1431' 205" the rock is
 blue grey calcareo-arenaceous, weathering
 to a rich brown soft sandy material.
 This must represent the top of the
 New Gym horizon or very near it,
 that is the top as exposed at the
 Gym. This is also at the second
 house on the south side of the
 road as one travels west. My hand-
 levelling does not here check with
 the contours, but the top occurs at
 the house on top of the hill. I found
 the top of the hill by hand-level to be
 at 1436' 200"

The thickness of the Eaton + New Gym
 rocks by hand-level then is 95' or 96'.
 By the map it is 80-85'. I believe that
 the figure 96' is the nearer correct.

Hand-levelling resumed at curve at
 2nd house on south side of road.
 Started at 1415' according to map. At
 the curve and for a short distance
 up the hill dark shale pieces are
 seen in the road bed. These have
 been taken from the rocks above the
 New Gym horizon.

1415' - 1440' 25" - hiatus

● 1440' 25" - 1445' 30" - dark grey sandy
 shales with few fossils, they have
 a strong purple weathering on the
 surface.

1445' 30" - 1450' 35" - same

1450' 35" - 1455' 40" - here the rock
 contains many orange brown

rust spots or pockets of it, probably from decomposed pyrite.

At just about 1455' 40" can be seen a small exposure of sandstone that are slabby, and, when fresh, quite bluish, but when decomposed are brownish grey with tiny brown rust spots. This rock contains *P. flabellum*, *C. mucronatus*, and a small *Spinifer*. This small exposure in the dirt represents the bottom of the Fertiland Stock Farm horizon. The rocks below yielded no fossils here as they are only exposed as a bank and in the narrow road gully.

1455' 40" - 1465' 50" - at the top of this interval is exposed imperfectly about 2' of rock which represents the top of the Fertiland Stock Farm ^{as exposed there} horizon just as seen on the west side of the hill along the Eaton Road. The rock is a hard calcareo-siliceous rock containing *D. oamaruensis*, *P. rana*, *Athyris* sp., *S. truncata*, *S. perplana*. In places the rock is very calcareous.

1465' 50" - 1515' 100" - hiatus 1465
1515
At 1515' 100" - almost at 4 corners of road intersection come dark gutter shales with a purplish varnish to their exterior. These are exposed as a single NW facing joint face, a gully a few protuberances of rock form the joint face. The shales also rust yellow & brown.

as well as purple. In the gully some 8 or 10' are exposed, while in the joint face fully 15' of rock must be shown up.

Fossils

S. arctostriatus c
A. umbonata
M. subalata
N. oblongatus
P. dischidium (large)

C. indenta n
S. pennatus n
C. boothi n
C. setigerus
C. mucronatus

These rocks are not very profusely fossiliferous and particularly not in the upper part of the exposure. The fossils are poorly preserved. The exposures terminate almost at the four corners on the side south of the Summit Farm Tea Room.

Sept 13'

About 1615' AT. sandy shales with *N. lirstum* exposed in the road bed. They are grey and about 15' vertically. Further down the road they have *A. umbonata*, *S. pennatus*.

C. mucronatus - about 1580 here the rock is shalier.

At about 1560 on this road the rock is very fossiliferous, containing *S. pennatus* cc, *C. mucronatus* cc, *N. arguta*, *Pal. concentrica*, *A. princeps*, *Attheyia*. The rock is rather coarse and sandy here and from the fauna appears to belong to the rock just above the Fertilizer horizon. ss. slabs appear at about 1557' &

Moravia
Road

16' } Covered

5'5" } Covered
5'5" }

10'10" } Covered

65' }

S

H

1336'110"

1331'106"

1324

1321

1311'90"

13

1306'80"

1301'75"

1296'70"

1286'60"

1276'50"

1236'10"

1226'

15' }

54' }

8'10' }

10'10' }

27' }

19' }

Covered

Covered
Bottom of feet

Covered

Covered

1515'100"

1465'305"

1455'405"

1445'205"

1415

1431'205"

1426'200"

1421'195"

1416'190"

1411'185"

1406'180"

1343'115"

1338'110"

1406
1301
1312
69

1431
12
1443
132
96

886

886

Sept. 15 - Rain
Sept 16

Electric Light Stream - 200' horizontally from the bridge on the Eaton-Morrisville Road rock is exposed. It is here at the bottom blue grey calcareous rock with productella. It represents the bottom of the Esopus horizon. This lowest rock is at an elevation of about 1250' A.T.

At about 312' upstream and just below the dam can be seen a large exposure of these rocks. The rock in the first 5' is a hard sandy shale of very massive appearance and in which are seen very few fossils. But at 10' 10" above 312' the rock becomes a rather soft shale carrying abundant fossils as:

- | | |
|----------------------------------|--------------------------|
| ✓ <i>T. bellulus</i> | ✓ <i>M. subulata</i> |
| ✓ <i>T. carinatus</i> c | ✓ <i>Leptopteria</i> sp. |
| ✓ <i>M. oblongatus</i> | ✓ <i>M. concentrica</i> |
| ✓ <i>C. boettgeri</i> | ✓ <i>S. andersoni</i> |
| ✓ <i>P. lirata</i> | ✓ <i>Gon. hamiltoni</i> |
| ✓ <i>P. spinulicosta</i> | ✓ <i>S. perplanus</i> |
| ✓ <i>Nephritica</i> sp. | ✓ <i>P. rana</i> |
| ✓ <i>C. indenta</i> | |
| ✓ <i>P. flabellum</i> | |
| ✓ <i>S. granulosa</i> | |
| ✓ <i>H. lehayi</i> | |
| ✓ <i>P. pygmaea</i> | |
| ✓ <i>P. hamiltoni</i> | |
| ✓ <i>Stenochertella perversa</i> | |
| ✓ <i>C. scitulus</i> | |

Corals were noted at approximately the top of the interval 10' 10" and the list above belongs to the coral horizon.

10' 10" - 15' 15" at the very bottom of this interval comes softer shale crumbling to small fragments and bearing small animals.

<i>Pholidops</i> harr.	<i>H. delayi</i>
<i>A. erectum</i>	<i>N. oblongatus</i>
<i>C. mucronatus</i>	<i>S. perplana</i>
<i>A. umbonata</i>	<i>N. trigonatus</i>
<i>Poly. concentrica</i>	<i>S. archata</i>
<i>C. boothi</i>	<i>M. pygmaea</i>
<i>T. cymatulus</i> r	<i>O. parvula</i>
<i>P. lirata</i>	<i>B. submarginata</i>
	<i>C. vicinus</i>

The zone of very abundant *Pholidops* only continues for about 2'. Rock is exposed at this locality to about 1285' A.T.

The rock just on the coral horizon which is only about 3" thick here crumbles into very small fragments. About 2-2½' above the coral zone abundance *Pholidops* becomes less and fossils are scarcer and larger. Here *Lophonemas* + *Bembexias* come in but are not as abundant here as at Delphi Falls.

A. erectum is common in coasts just like those at Delphi. Debris here is rich in fossils + this is easily the best locality for the study of this horizon.

30-35' of rock are exposed mostly all of the softer shales except for the 10' below. At the top the shales are just becoming ss that they break in large slabs.

Concretions of small size & irregular shape are common in these lower beds. Also thin-rod-like pyrite concretions. *Pholidops* ranges for a short distance above 15' 15". It was not seen here but a diligent search should reveal it.

Sept. 16'

Sandy shales in road gutter. They belong somewhere below the New Byron as the stone-walls here are of ss slabs.
S. pennatus
L. laura

A short distance south up the hill at about 1470' sandy shales are seen at the road side. They have a purple weathering and are like those opened on the new water tower. *P. fragilis*. These rocks crumble to small bits and are not very fossiliferous.

Sept 16²

In the woods 45' above Sept 16' is a rather extensive exposure for several hundred feet. 15' 10' A.T. This consists of weathered medium gray shales for about 5' and then a 7" band of slabby sandstone with

Shales above ^{then more ss.} for 3' 15' above this exposure is another similar one, but less extensive with sh + slabby ss. This must represent a portion of the alternations below the U. Quarry horizon.

Sept 16³

1540' A.T. grey sandstones with irregular fracture ~~not~~ into the flat slabs characteristic of the upper beds of the U. Quarry. Also on south slope of hill above the exposure.

Sept 16⁴

coarse shales of New Gym horizon lining south (steep) bank of Electric Light Stream. Exposed poorly for about 25' vertically. The top of the Gym is 25 or 30' above the stream or at 1340'

Sept 16⁵

Top of New Gym horizon at about 1403' A.T. It is here composed ss which are slabby + calcareo-arenaceous stone.

Sept 16⁶

In the road adjacent to this gully at about 1460-1450' A.T. come ss. slabbey which must belong to the Fertilizer horizon. These were found 312 paces from the house on the hill. And where the gully flattens slightly 400 paces from this house but to the east in the gully are grey sandy shales becoming less sandy

downstream. They are exposed in a series of cascades from the 400th pace below the house in the stream for about 20-30' vertical.

The top of the ~~Permian~~ ^{Permian} in the gully is 325 paces from the Electric Light Station. This would make it 1380'-1400' A.T.

Sept. 16th

Rock of the New Gym horizon exposed on both sides of the bridge which is just below (south) of the road intersection. Here the rock must be at about 1335' A.T. It consists of a cascade about 3' high in low steps, the upper one being 1 1/2' high. 100 paces upstream from the bridge are to be seen soft dark shales which belong to the bottom of the Fertiland horizon. These are here exposed for about 8'.

The continuing on this stream must be wrong. The gym horizon certainly terminates a short distance above this bridge and is surely found at 1390'-1400' in the gully, not in Sept 16th.

The change in lithology is not as abrupt as the change in fauna as the shales are somewhat sandy and compact altho they become soft on weathering in contrast to the hard rocks below.

Electric Light Stream

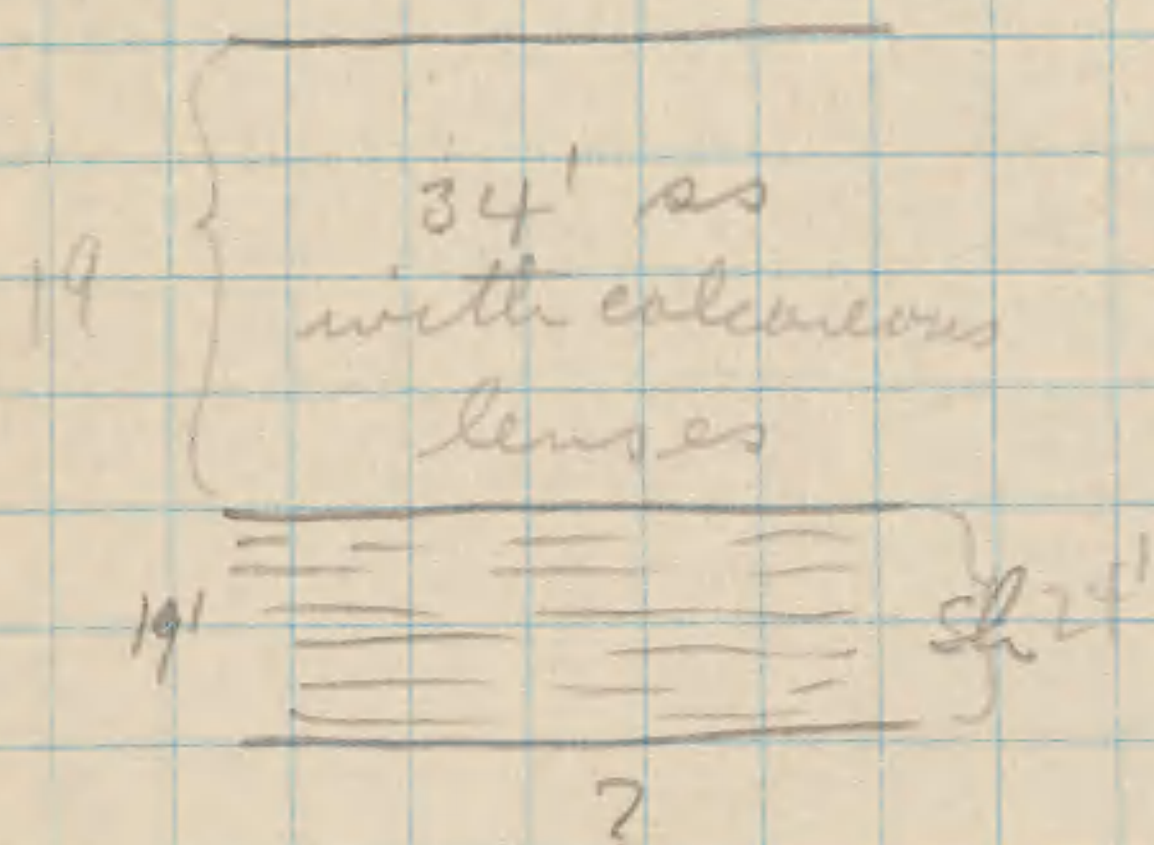
About 20' of the sandy shales are exposed here below the sandstone. The soft shales on the Eym were only exposed for a short distance about 700 paces upstream from the bridge. At the 10' 10" of ss. in the ss. were seen *A. erectum*, and *P. flabellum*, the former of gigantic proportions. *P. flabellum* is the most abundant fossil of the sandstones. Others are *M. concentrica*, *N. arguta*.

At 3 steps + 2' the calcareo-arenaceous rock of the top of this horizon is seen. I saw no *Emella* lenses in this portion of the exposure but they were seen before at about 1360' A.T. at the bend of the road in a small side stream.

There are 18' 3" of ss. exposed here and 2 - 2 1/2' of calcareo-arenaceous rocks with *A. spiniferoides*?, *S. pennatus*, *S. granulatus*, *C. mucronata*, *R. vancouveri*, *Aviculopecten* etc. 73 paces above the base of the 2 or 2 1/2' of calcareo-arenaceous rock, softer rock contains hosts of *N. arguta*, also *S. granulatus*, *N. trigonatus*, *S. pennatus*, *A. umbonata*, *M. concentrica*, *P. liata*, *N. dekeyi*.

About 470 paces upstream from top of falls comes the highway bridge.

The hard sandstones & calcareous lenses continue up to 43 above base of exposure. In the ss. may be found *P. flabellum*, *H. arguta*, *S. hamiltoni*, *S. granulosa*. but best fossils are found in the ls lenses, also *C. recurva*. The total thickness of the rocks exposed is about 43-ft. From J 16¹² it should appear that the lenses bearing *E. luciblaeni* are near the top of the top, and at the top is a stone like that of at J 16¹⁰.



which bore many *Stropheodontas* & *Bygonia*. These observations must be checked to be revisited for collecting.

June 17⁹

A large quarry with about 5' of hard blocky sandstones mounted by about 10' of soft black shale. This sequence may be the black shale that normally rests on the sands of J 17⁸. About 3' from top of ss bed in the shale is a 6" sandstone stratum. All Burry.

Joints

N 31 E

N 30 E

N 26 E

They are spaced from 3-7' apart. The joints do not

June 17⁶

Grayish weathered shales with few fossils, the same horizon as at J 17⁴

Leiopteria sp.

N. corbuliformis

Note - specimens of the various rocks must be collected, both weathered and fresh, for determining alteration on weathering

June 17⁷

Same shales as J 17⁶ in road gully.

June 17⁸

Electric Light Brook

The lowest rock in the stream is a blue gray sh. where fresh with few fossils. This is the same shale as in the road at J 17⁶

N. corbuliformis

H. dekeyi

Leiopteria sp.

N. triquetra

Lingula sp.

B. retrofracta

A specimen of *Bucina* links this up with the dark shales of Upper Chocoma Glen. This specimen was found at about 19' above the base of the rock which is here exposed at the top of the second cascade about 24' from bottom, the shale has changed to a hard slabby sandstone which breaks into larger blocks. Between 27 and 33' above base of outcrop was found a calcareous lens abounding in snails and *Nyssa arguta*.

run up into the shales. A hasty examination revealed no fossils in the black shales. Photo

This quarry is located between 1520-1540'

Sept 17.

Livermore Proprietors of
Ravine of the Elmview Farm.
Livermore Ravine

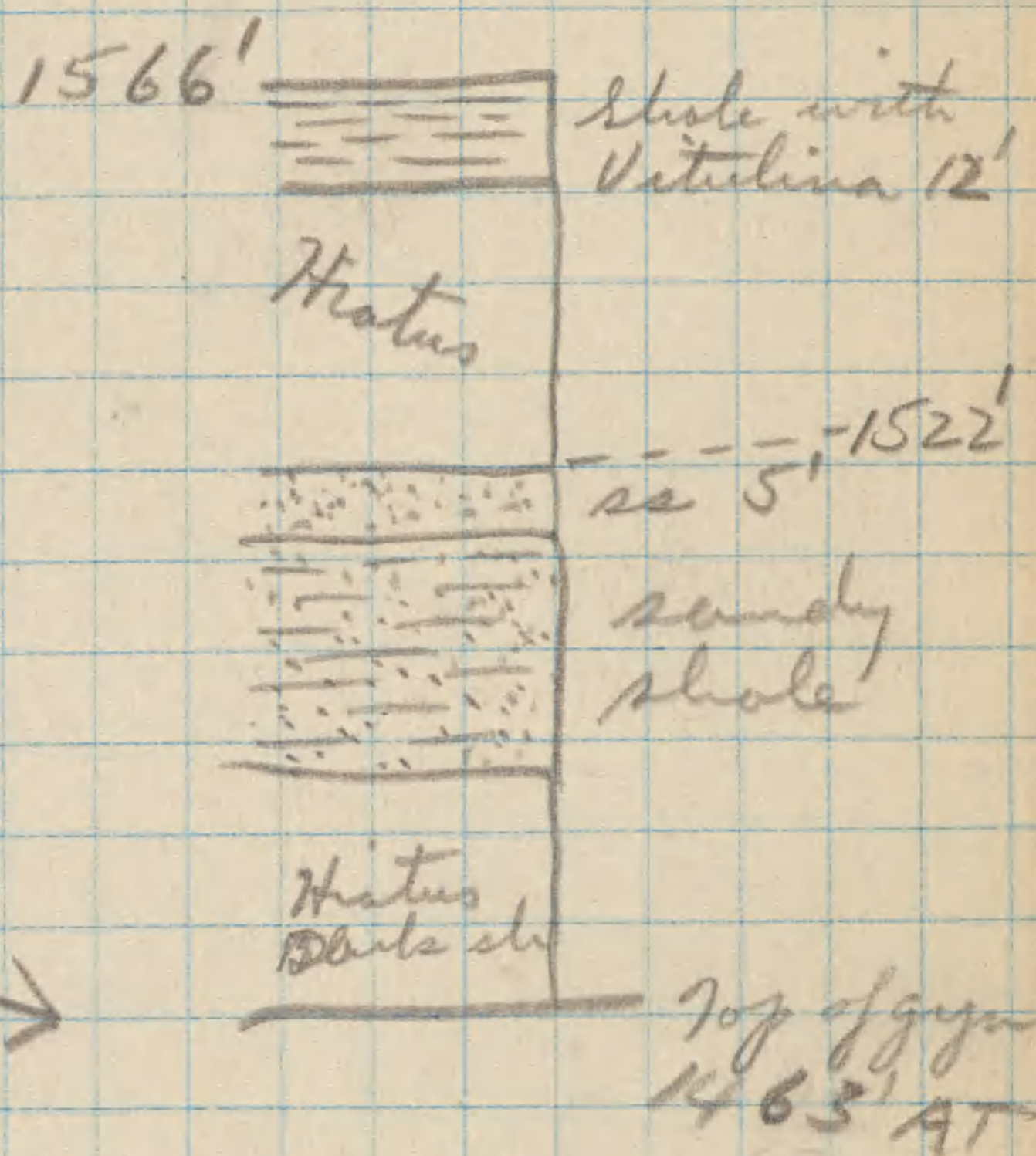
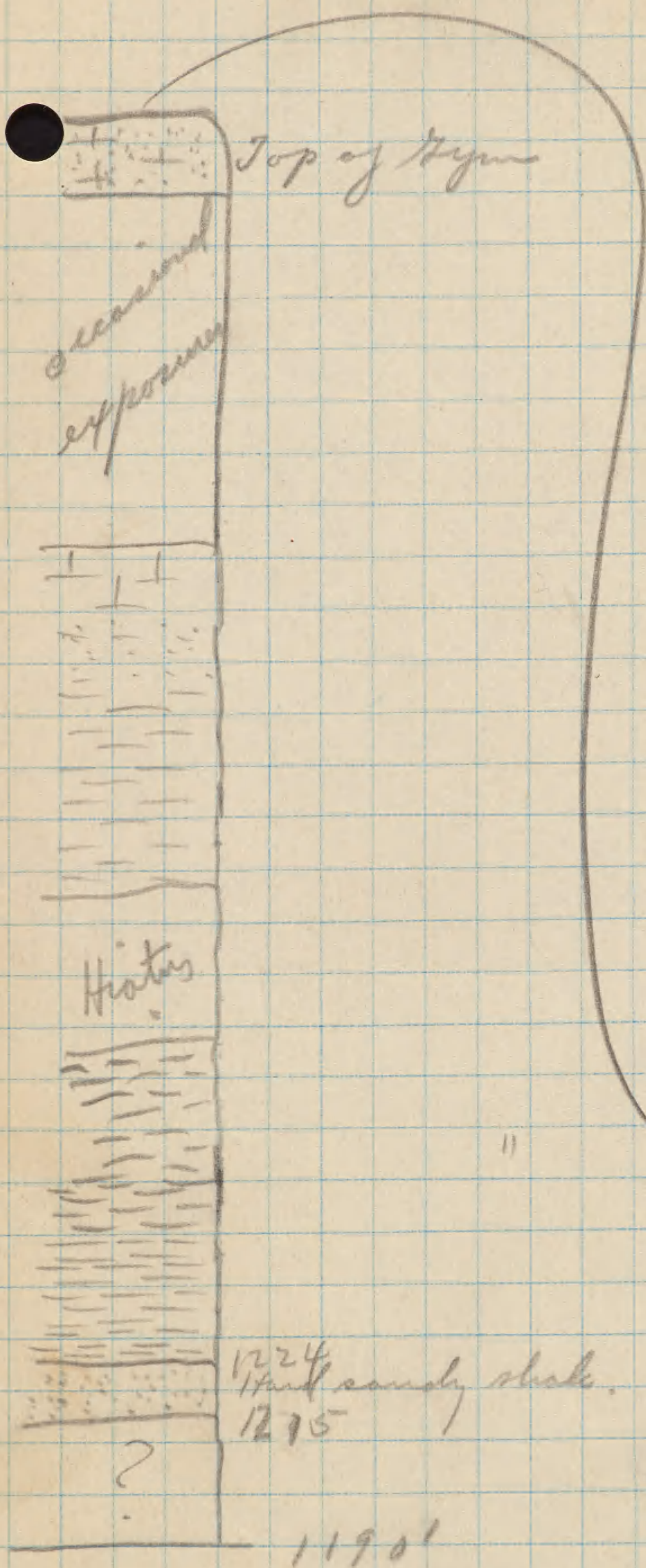
25' above the road is found a hard sandstone rock. The road intersection at the entrance to the ravine is at about 1190' A.T. Hence, this hard band is found at 1215' A.T. I had no success at collecting the hard rock here. At 1220' 5" the band forms a cascade in the stream. The thickness of the band as exposed here is about 10'. *S. cratellum* and crinoid stems were the only fossils observed. Also wood fragments.

Top of hard band at 1224 A.T.

These ss are succeeded by a soft gritty shale that crumbles into small fragments. On the north side of the ravine, just above the Pine Woods hard band these are exposed for about 15 or 20' vertical and chips strewn the slopes. Fossils found in the chips on the slope are:—

✓ <i>N. randalli</i>	<i>S. cratellum</i>
✓ <i>C. mucronatus</i>	✓ <i>L. laevis</i>
✓ <i>C. setigerus</i>	✓ <i>S. pennatus</i>
✓ <i>A. umbonata</i>	✓ <i>P. biata</i>

1230' 40" - 1235' 45" The rock in this interval is only sparsely fossiliferous but *S. subulatum* and *L. laevis* were seen. The rock is dark grey and only slightly gritty. With acid it gives no effervescence.



Each square 10'

1235'45" - 1240'50" - *L. laura* was the only fossil seen in this interval.

The individuals are very large, the largest of any in the lower part of the Hamilton.

1240'50" - 1245'55" - Practically no rock exposed in the stream bed, but in the cliff on the ravine sides 35' or 40' of rock can be seen.

1245'55" - 1250'60" - large *Leiorhynchus*, and more of them. Other fossils becoming more abundant.

✓ *L. laura* cc

✓ *C. scitulus*

✓ *A. umbonata* ~

✓ *N. corbuliformis*

✓ *N. oblongatus* ~

Orthoceras sp.

✓ *C. setigerus*

Crinoid stems.

Lox. hamiltoniae

S. minutum?

275
1190
1465

1250'60" - 1255'65" -

✓ *L. laura* c

✓ *A. umbonata* ~

Lox. ham. ~

✓ *C. scitulus*

✓ *S. pennatus* ~

✓ *C. setigerus*

✓ *L. densa*.

1255'65" - 1260'70" hiatus

1260'70" - 1265'75" - collecting difficult but numerous *Pleurotomaria*, *N. randall*, *L. laura*, *Bellerophon* sp.

1265'75" - 1270'80" - a couple feet of shales exposed at the top of this interval are softer and crumble more readily than the rocks below. Small concretions.

are quite abundant. Fossils noted are: - *C. scitulus*, *S. pennatus* c, *L. densa*, *Pal constricta*

1270'80" - 1275'85" - hiatus
1275'85" - 1280'90" - poor exposures but excellent collecting and here the fossils are rather large. The exposure is at the top 3' of the this interval: -

✓ <i>S. granulatus</i> ? r	<i>Pac. hamiltoniae</i>
✓ <i>S. pennatus</i> rc	✓ <i>Cyt. hamiltonensis</i>
✓ <i>C. scitulus</i>	<i>C. scitulus</i>
<i>L. exigua</i>	<i>P. flabellum</i>
<i>L. macroptera</i>	✓ <i>S. perplana</i>
<i>Goniophora</i> sp.	<i>P. lirata</i>
<i>M. concentrica</i>	<i>Productella</i>

1280'90" - 1285'95" - *Productella*, *Pal. constricta* - large snails.

1285'95" - 1290'100" - hiatus.

1290'100" - 1295'105" - hiatus

1295'105" - 1300'110" - "

1300'110" - 1305'115" - "

1305'115" - 1310'120" - "

1310'120" - 1315'125" - "

1315'125" - 1320'130" - the shales are crowded with *L. laura* - other fossils are *H. triquetra*, *C. scitulus*

1320'130" - 1325'135" at the bottom of this interval *L. laura* disappears & *C. scitulus* takes its place in abundance. Snails are also present

900

900

$$\begin{array}{r} 1440 \\ 21 \\ \hline 1461 \\ 1380 \\ \hline 81 \end{array}$$

1425

$$\begin{array}{r} 1440 \\ 21 \\ \hline 1461 \end{array}$$

$$\begin{array}{r} 1480 \\ 23 \\ \hline 1503 \end{array}$$

75-75 80'

$$1365' 175' - 1440' 250'' - \text{New Gym}$$

1425' 235'' - 2' to 1480' 290'' + 3' - Fertiland horizon. Above the Gym. 27' of the sandy shales below the sandstones form a cascade just where the ravine opens into the fields. About 5' of the slabby ss are exposed between the 10th & 11th hand-level steps above the level of the New Gym. The New Gym horizon here is apparently only 80' thick.

11 steps - 17 steps above New Gym liates 17 hand-level steps above the New Gym a short exposure of dark shales with

✓ *V. pustulosa* cc
 ✓ *C. umbonata* c
 ✓ *C. scutellus*
N. oblongatus

S. pelyplana
 ✓ *S. pennatus*, c
M. triquetra
T. submarginata
Orthoceras sp.

19 hand-level steps above New Gym is top of these shales, as only 41' are exposed. It is a sandy shale with dark color with *S. pennatus*, & *C. umbonatus*. This is responsible for a small cascade and a flat.

26 1/2 steps down from top of coal bearing bed to top of hard layer 16 steps down to top of bed with large spinifers & *Chiroptera*

here. The rock is becoming coarser

1325' 135" - 1330' 140" - in a soft gray shale

L. laura

C. scitulus

A. umbonata

A snail

M. pygmaea.

1330' 140" - 1335' 145" - Small *Ambocoelia* abound in the rocks here

C. scitulus

M. pygmaea

H. dekaigi

M. orbuliformis

Large *Pleurotomaria*

Strombocyclia sp.

1335' 145" - 1340' 150" - No fossils

1340' 150" - 1345' 155" - *C. scitulus* a, *P. radiata*, A few calcareous concretions were also seen. This permits making the exposure on the Lake Moraine Road near the Jones's Farm. It must represent this horizon by virtue of the presence of *P. radiata*. The abrupt change of an *Ambocoelia* zone to a *C. scitulus* zone was also noted at Lake Moraine.

1345' 155" - 1350' 160" - Rock hard & resistant - no fossils

1350' - 1365' 175" - Top of this horizon, top of state Rd. Quarry ^{Marshall} The top is then at 1380' A.T. JH

The hand-levelling down the ravine does not check with that up the ravine. The elevation should be about 1370' A.T. to the top of the coral bed.

The gym horizon here appears to be thinner than it is in other places, but the Festiland horizon is just about 60'. There should be about 10' more of ss. here and this would take off some thickness from the shales above. The sandy rock above the Vitulina zone was hard and had very few fossils.

Silvermoor

98

$$\begin{array}{r} 1300 \\ 1215 \\ \hline 185 \\ 144 \end{array}$$

$$\begin{array}{r} 1320 \\ 11 \\ \hline 1331 \\ 7 \\ \hline 1338 \\ 49 \end{array}$$

12
32
5
27
25
79
10
32
32
8
8
10
5
33
3

5'5"

No fossils

1340'150"

5'5"

Small
ambocelia

1335'145"

5'5"

C. scutellus

1330'140"

5'5"

L. laura zone

1325'135"

5'5"

1320'130"

1315'125"

$$\begin{array}{r} 1366 \\ 1295 \\ \hline 354 \end{array}$$

✓ 12'

Vitulina 32'

✓ 32' Covered

$$\begin{array}{r} 1285 \\ 8 \\ \hline 1293 \end{array}$$

✓ 32' Covered

$$\begin{array}{r} 1365 \\ 15 \\ \hline 1380 \end{array}$$

144

✓ 8'5" Very
Fossil

1285'95"

1280'90"

1275'85"

1270'80"

1265'75"

1260'70"

1255'65"

1250'60"

1245'55"

1240'50"

1235'45"

1230'40"

1225'35"

1224'30"

1220'30"

1215'25"

30' ✓ 5' ss.

✓ 27' Sandy sh.

✓ 8'3" Rubbed

10'10" 3 1/2' covered
5'5"

5' Covered

$$\begin{array}{r} 36' 1/2" \\ 32 \\ \hline 650' \end{array}$$

25' Covered

$$\begin{array}{r} 1440 \\ 21 \\ \hline 1461 \\ 1350 \\ \hline 81 \end{array}$$

1440'250" - 2'1459'

79' Lymnaea
70' covered

Top of State
Rel. Quarry

1365'175"

1350'160"

1345'155"

1340'150"

$$\begin{array}{r} 1380 \\ 1224 \\ \hline 156 \end{array}$$

9

9 ✓
 125 — (100)
 65 ✓
 14 ✓
 27 ✓
 25 ✓
 3 ✓
 32 ✓
 12 ✓

 349
 10
 33

1285
 6
 1291

1225
 1295
 32

1285
 1228
 56

902

902

The last exposure here on the map is at 1860' A.T.

340
1128
4

Sept 19.

Recheck on height of New Gym at Upper Chases Glen - From top of hard layers 65' above road to top of hard layer where glen flattens above was $13\frac{1}{2}$ steps or 73'. Top of Camarotoechia coral band is at 1220' A.T. Top of gym is at 1293' A.T. Probably all of Gym not exposed.

clay Payne St. Ravine
Is with corals occurs at 1200' A.T. By hand-level it just 16 steps to top of New Gym, 86' 6" and occurs at 1286' 6". The dark shales exposed belong to the Fertland horizon.

Fossils here are - *N. oblongatus*
A. umbonata, common in lower part, small
N. oblongatus sp.
N. trigaster

The shales above the New Gym are exposed for 390 paces upstream or about 50' vertical. The upper ss. were not seen here.

The top of the New Gym comes about 10' below the apex of the [] in the road just above the residence of Carpenter & Parry. This is at about 1285' A.T. A check down hill gave 16 steps for New Gym horizon.

6b 1112

Aug 11. 904

904

1200' hard sandy sh of bl. quartz

1210' hard edged sandstone as at 1200'
at 5'

1220' the soft crumbly shales of the
Pachypora horizon in a zone of
25' vertical, crumbled to small fragments

2' sandstone is noted at 1220' higher
levels

These shales are capped by a calcareous
sandstone at
containing many *Spinifers* and
Oculus

20' above falls shales, dark soft
like those below but with a
different fauna.

70' above falls about 12' of sandy
stone resistant to weathering.
Crinoids abundant

114' above 1st falls blue shales
with few fossils.

145' above 1st falls the stone has
become flat shaly sandstone
like that at the U. horizon. Here
the hill is flat at about 1520' level
Hence the 1st falls is at 1374'.

66 J11

Aug 11.

1423' Sandy calcareous stone
with abundant *Camerozoechias*
and small *Strophomena*. Some of
them are probably graptolite.
All from the same thin blue
stone at 2 m. distance.

<i>P. flabellum</i>	<i>P. lineata</i>
<i>P. costata</i>	<i>P. carinata</i>
<i>C. mucronatus</i>	
<i>B. sulcomarginata</i>	
<i>Cyrtoceras</i> sp.	
<i>S. perplana</i>	
<i>I. carinata</i>	
<i>N. corbuliformis</i>	
<i>C. induta</i>	
<i>H. dekeyi</i>	

The lower compact stone
is made up of lenses
of fossils and has
Camerozoechias and has
the peculiar clay tubules
noted at 2 m.

very arenaceous shales with
abundant fossils which
grade into blue shales that
crumble to tiny blocks on
exposure. But the blue soft
part they contain many
Productella.

L. lineolata

A. parvula

Strophomena cf. lineata

The fossils of the shales on
the sandy lenses are not
deformed.

906 18

Livermore's Ravine

906

66 H12.

Solonville

Restudied

1200' compact sandy rock.

1212' hard compact so probably calcareous forms, flat at entrance to ravine. The rock has few fossils.

d & f forms cascades for about 10' upstream. This band was also noted in stream N.E. where Comblain was found.

At 1217' rock is more extensively exposed and well jointed, very hard & compact. Trilobites are very common, but other fossils are scarce.

Prevailing joints

N42E
N39E
N43E
N36E

1223' Same

1228' soft, dark shales, weathering where exposed to small chips. These have *L. laura* of the same kind as the shales at the Pecksport railroad intersection and are referred to them.

These shales weather to a rich red-brown color.

Fauna

A. muricata
C. setigerus
C. mucronatus
L. hamiltoniae
 Crinoid stems

1200'

1212'

1217'

1223'

1228'

1263'

1382
1228
134

1350'

1362'

1390' Bottom etc.

1467
1362
105

1467'

1503'

city shale

city shale

When fresh the shale is grey-blue in color and of very even and soft texture being composed of a clay. When protected but breaks in large irregular fragments with a subconchoidal fracture.

At 1238' fully 30' of rock is exposed. 1255' L. laurina is abundant and of large size.

30
100
110
170
110
100

McBottle

1362

32
100
110
200

At 1353' the stone becomes progressively harder till at 1362' the brook comes over a falls made up of hard calcareous-arenaceous rock, belongs to hard layer at Birchard's. At 1363' shales are again encountered, somewhat calcareous with abundant fossils contrasting with the comparatively unfossiliferous rocks below.

1448
1362
86

1390' 10 or Eaton sh.

415

1353

225
219
240
249
143

1448

Delphi

1436' 12' cascade in hard rock, some of it sandy. Represents top of Kent Byron.

1434
1362
72

6 b d 12

57

103
24
249
136
100

1503' 30' of rock representing top of black shale resting on Kent Byron and beginning of Avarny horizon. No fossils were noted in any of the slabs. Slabby ss. visible on top.

Sept. 21

Patterson's

Joint rock is between 8 & 9 steps at bottom of 9th step. This is at 1158' 4" AT

1158' 4" - 1163' 9" - Grey sandy shale of irregular fracture

1163' 9" - 1168' 14" - mostly covered

1168' 14" - 1173' 19" - Grey sandy shales

1173' 19" - 1178' 24" - same

1178' 24" - 1183' 29" - These shales from 1168' 14" - 1183' 29" are the ones that carry *H. vanuxemi* corals, *S. laura*, *Althysia* and *C. induta*. At 1183' 29"

1183' 29" - 1188' 34" - layers of ss a few inches thick are becoming prominent in the shales. A couple 1183' 29" caused a cascade. These are the beginnings of the ss that form the Bl. Quarry. Some of the shales at 1188' 34" are of ss with a very irregular surface and are veneered by a shale surface on the parting planes.

1188' 34" - 1193' 39" - sandy sh with an occasional ss layer 1" thick

1193' - 1198' 44" - at the top of this interval the ss have become more prominent and are beginning to dominate over the shales.

1198' 44" - 1203' 49" - same

↑ 1330'

Blue grey
Earlville
sh.

15"

1298' 9"

1300

Red Gate

1300

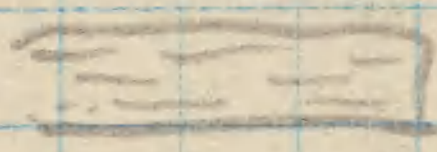
1268' 11 1/4"

U. Chert 35'

1233'

1203

1193



1330 cont'd

1158' A.T.

Each square 5'

The rocks in the last two intervals are best described as sandy sh and sandstone alternations.
 1203'49" - 1233'79" - sandy shale and sandstones in alternations, but at the top of this interval slabby ss have become established and it is near here that the U. Quarry comes in. The latter comes in at about the top or middle of 1233'79" - 1238'. The U. Quarry stone continues up for about 1238'84" - 1268'114" or for about 32'6" + about 2 1/2' above the 1238'84" - 1268'114" making about 35' thickness for these ls.

1268'114" - 1273'114" - a half of this belongs to the U. Quarry, the other half to the Red Gate horizon.

1273'114" - 1288'129" - Red Gate

1288'129" - 1289'131" - Calcareous - arenaceous rock. The lower layers are very calcareous & have the fluted weathering characteristic of a ls. One characteristic fossil obtained here was *D. sculptilis*. This horizon (bottom) occurs at 1298'9".

In blue grey rock 20' above the ls. were seen:-

R. fimbriata
G. carinatus C
S. channingensis
A. decussata
Pholidops
S. divaricatus
S. granulosus

P. rana
A. reticulatus

There are about 34' of blue grey Earlville shales exposed up to the point where the ravine flattens out.

1289' 131" — 1323' 161" blue grey sandy sh. of Earlville horizon. 10' above 1323' 161" there are about 1½' of shales 30' 30" above 1323' 161" there are about 8' of shales exposed up to about 1361' 161". These shales on the west side hill are very sandy; — They contain: —

Camarotoechia sp. c

P. marginata

N. corbilitiformis

These rocks are only sparsely fossiliferous

Sept 23, 1927

The top of the Pine Woods hard band occurs at exactly 1200' and is seen at the bend of the road just before it starts down-hill. At the road passing north just at the brink of the Pine Woods Hill the top of the layer is at 1205'. The rock extends down the hill to 1162' A.T. becoming softer down the hill and it is near here that the Cardiff-Shanaghtiles-line must come in. The shales are sandy-blue-grey.

In the hard layer below 1190' were seen *C. mucronatus*, *S. perplana*, *P. liata*, snails.

In the hard layer at 1200-1205' were seen *P. liata*, *L. obsoleta*, *L. macroptera*, *P. flabellum*, *S. perplana*, large *Nepluticeras*, *Spirifer granulosus*, *Trochomena*.

Above the hard band, on the north road at 1250' A.T. outcrops were seen in the gutter & on the roadside of soft, whitish, blue grey sh. with *Fox. hum.* and large *Leiorhynchus* of the Pecksport horizon.

912
Solville

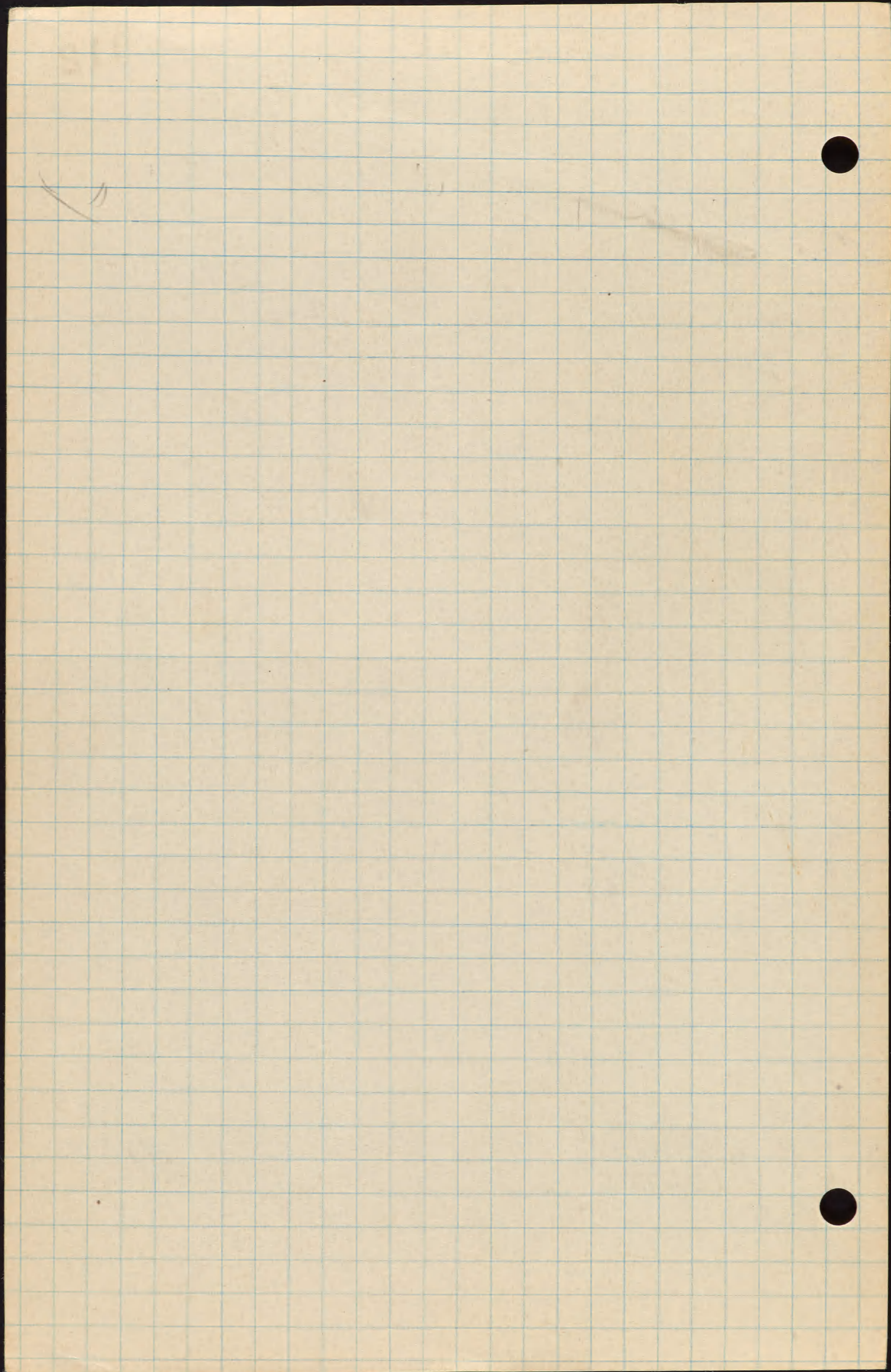
912

Sept 24. 1927

Collected in hard band north of Solville. This band runs the hill north and west of Solville with a discontinuous wall of sandstone or sand-shale between 15-20' high. The stone breaks readily by the processes of weathering to irregular slabs. The rock is exposed for fully $3/4$ of a mile around the hill. On weathering the stone inside becomes a yellow grey but on the outside is a dirty grey. Often on a flat surface there are pits suggesting solution weathering. The rock stands on the hillsides as very stout pillars all checked to a mass of small fragments. This effect is produced by the breaking off of large joint blocks and then the corners are weathered off. Large flat masses also break off and slide down the steep slope of the hill. This rock is very resistant and forms a conspicuous ridge wherever it occurs. It accounts for a ^{large or less conspicuous} terrace on the hillsides from Pine Woods to Solville.

Concretions are quite common & are rounded calcareous masses containing fossils. Tronimus is abundant also. Other markings unfamiliar to me.

Fossils are mostly brachiopods & Pelecypods. They are not abundant only moderately so.



Many of the fossils are peculiar to this horizon.

- | | | | |
|------------------|---------------|-----------------|------------|
| ✓ M. concentrica | r | ✓ C. mucronatus | re |
| C. contuens | r | ✓ S. granulatus | re |
| ✓ N. concinna | re | ✓ S. andaculus | re |
| ✓ P. flabellum | cc | Spirifer | sp. |
| Lunioptera | sp. vr | ✓ R. princeps | r |
| S. triquetra | r | H. DeKayi | r |
| P. lirata | r | ✓ S. perplana | re |
| ✓ R. grandis | vr. | S. crotalum | vr. |
| ✓ Calmarotocchia | sp. vr. | ✓ Hammyria | arusta vr. |
| Ostroceras | (several sp.) | Nephriticeras | sp. |
| Lingula | sp. | Toxonema | sp. |

Sept 24'

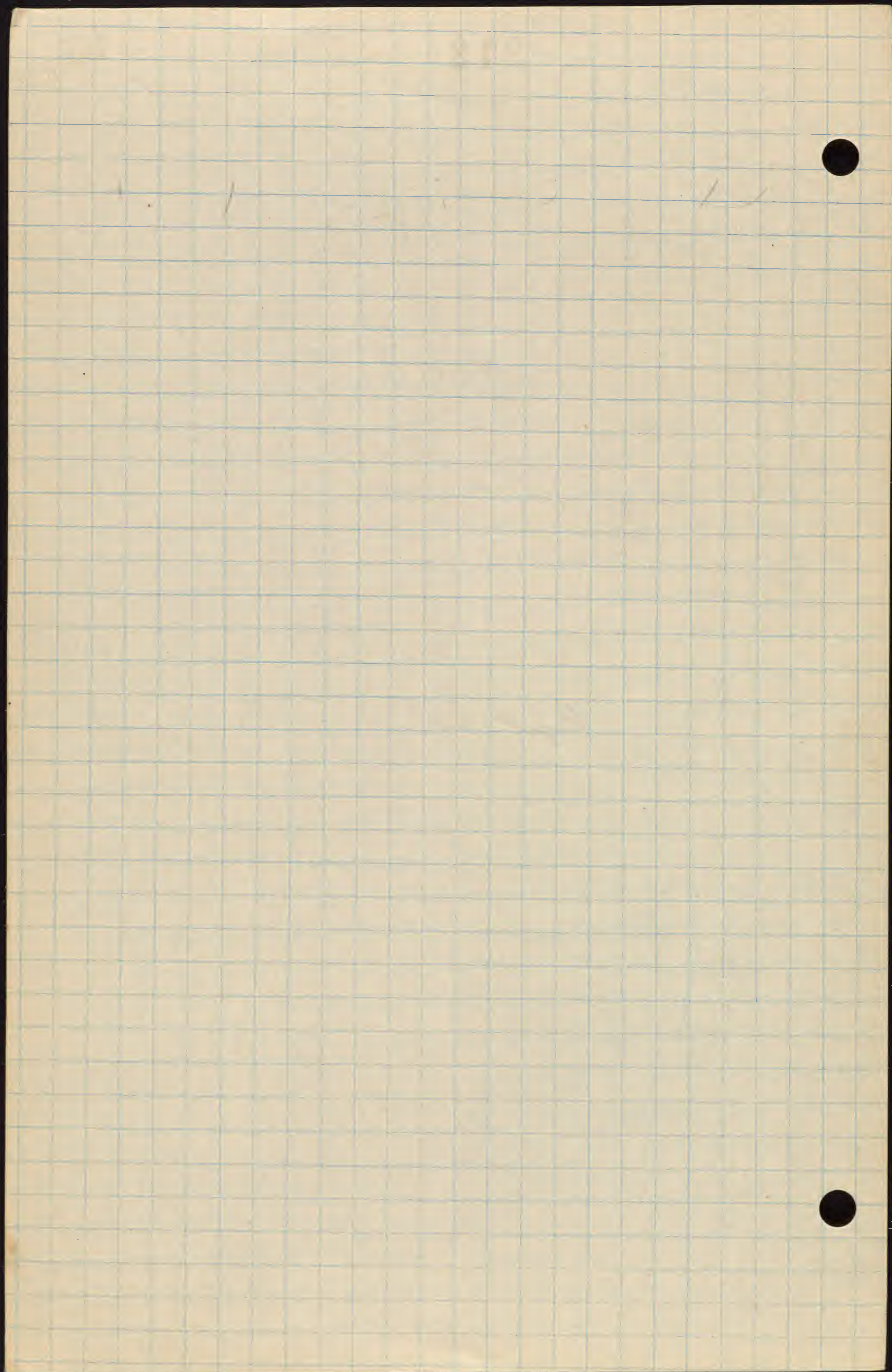
Creek 1 mile N.W. Solville

Between 4 + 5 steps soft, dark blue gray shales, very faintly girty. A very small exposure. They are Cardiff 1278'

At 1293' the same shales are seen in a small exposure about 3' vertical in the stream bed.

Between 1310 and 1315 in the stream bank are seen dark blue gray shales that crumble into small thin chips, but not the paper thin flakes characteristic of the micellus. These are considerably rusted on their surfaces. The complete fragmentation of the stone prevents the discovery of fossils. About 10' vertical are shown here on the south side of the gully.

1320' the same



Between 1348 + 1353 same, no fossils - seen

Sept 24³
The top of the hard layer is here at 1434' A.T. It forms a terrace on the side hill. The rock appears at the surface along much of this terrace.

Sept 24²
In another small gully not far north of the one previous nearly 30 or 40' of the Condiff can be seen in patches. *L. laura* of large size was seen in the shales there.

N. oblongatus, *N. trigonatus*

Sept 24⁴ At top of hill, bottom of small quarry of Peckaport shales at 1460' A.T. Quarry about 10' vertical shales quite gritty, jointing very irregular

Sept 26

Hard, massive arenaceous rock
 with *I. carinatus*, *C. coronatus*, *P. flabellum*,
Cranella homiltoniae, *C. mucronatus*,
Althys sp., *A. princeps*, *A. fasciculatus*,
C. boottii, *M. concentrica*, *S. arcuata*,
H. dekanji, *C. congregata*, *A. boydii*,
M. arguta, *A. bursata*, *Leptostoma*. The
 horizon I believe, belongs to the
 New Gyn. *S. aluminosa*, *C. incanus*.
 This is at about 1535' A.T. - 1540 A.T.

Sept 26'

Top New Gyn horizon 1560' A.T.

Sept 26²

Top New Gyn horizon -

<i>I. carinatus</i>	<i>C. congregata</i>
<i>P. flabellum</i>	Crinoid stems
<i>L. macroptera</i>	<i>H. dekanji</i>
	<i>S. perplana</i>

Sept 26.

Ravine on the Woods' property

Stream meets main stream at 1350'

1350' - 1395' 45" - hiatus

1395' 45" - 1400' 50" - soft dark brown grey shales - no fossils - about 3' vertical

1400' 50" - 1410' 60" - hiatus

1410' 60" - 1415' 65" - soft grey shales at top for 3'. Breaking in rounded masses. Quite gritty when crunched. Fossils not abundant :-

*C. scitulus**L. laura**M. pygmaea**C. setigerus*

1415' 65" - 1420' 70" - same shale

C. scitulus c*N. oblongatus**L. laura* c*M. pygmaea*

1420' 70" - 1425' 75" - same shale

L. laura c*N. oblongatus* re*C. setigerus**Orthoceras* sp.*C. scitulus*

Wood

*N. corbuliformis*1425' 75" - 1430' 80" - ~~same~~ small concretions are not uncommon.1430' 80" - 1435' 85" - *Orthoceras* sp. The rock here at the bottom of this interval and into the middle

of the next is more resistant
and more arenaceous.

1435' 85" - 1440' 90" - *Aulopora*, *Therapsiformis*,
Orthis, *L. laura*, *M. oblongatus*,
shale decidedly gritty. *L. laura* is not
very abundant here but *Aulopora*
is rather common.

1440' 90" - 1445' 95" - *Mucronatus* seem to
be the commonest fossils with
fragments of *Orthis*. The shale
is quite hard & gritty.

1445' 95" - 1450' 100" - Beginning of fall at 1445'
Aulopora *M. oblongatus*
P. lirata *M. truncatus*
S. sinuatus *Lingula* 2 sp.

1450' 100" - 1455' 105" -
Aulopora
L. whartoni

1455' 105" - 1460' 110" - similar coarse
shale like that of lower gyri.

1460' 110" - 1465' 115" - *C. mucronatus*,
P. lirata - coarse shales

1465' 115" - 1470' 120" - The shales are
coarse and sandy here and only
have crinoid stems. This slope
however is not favorable to
collecting.

1445' 105" — 1485' 145" — top of falls.

Paracyclas is very common from the bottom of the falls to the top. Fossils are rare in the first 15' of the falls. *P. flabellum* comes in about 20' below the top & *Nucleospira* was found 10' below.

The top of the falls is at 1485' 145". *Spongia* comes about 1460'. The hard layer makes quite a flat here.

1485' 145" — 1490' 150" — 2' soft gritty shale with *L. luma* of large size. They have a purple weathering.

1490' 150" — 1495' 155" — same as a small patch in middle of step.

1495' 155" — 1500' 160" — 10' same

1500' 160" — 1505' 165" — same

1505' 165" 1510' 170" — hiatus

145'
1485'
12'
1497'

1510' 170" — 1515' 175" — hiatus

1515' 175" — 1530' 190" — between & 1515' 175" + 1520' 180" — the soft shales ~~that~~ have *P. flabellum* & long-winged *S. pennatus*.

979

919

Fossils seen in loose slabs of hard band:-

P. flabellum c
S. granulosa
S. scrotulum
H. deKayi

D. triquetra
Leiodontia
R. grandis
 Crinoid stems
N. concinna

At the head of the ravine at about 1550' a hard band about 1' or 15" thick occurs. This has *S. perplana*, *Productella*, *N. concinna*, *R. subornata*, *C. scitulus*, *S. pennatus*. This layer is probably local.

Sept 26³

At about 1610-1615' A.T. coarse shales which are lime & sandy & have *Spinifers*, *H. deKayi*, *P. flabellum*, *Camarotoechia*. It is the ^(Mottville) Bulchand Quarry horizon just below the coral bed. 250 paces north of the Woods residence. It is nearer 1610 than 1615' A.T.

Sept. 26⁴

Top of hard band.

Woods Ravine

510
1870
1495
114

15"
37'
1070"
17'

1550'

1535'

P. flabellum

Covered

1500' 160"

1485' 135"

1480' 130"

Neobospora

1475' 125"

1470' 120"

P. flabellum

1465' 115"

1460' 110"

1455' 105"

1450' 100"

1445' 95"

1440' 90"

1435' 85"

32'

1430' 80"

1425' 75"

1420' 70"

1415' 65"

1410' 60"

18' 1/2"

P. flabellum

1400' 50"

1395' 45"

3'

1550
1513

1513
1496
17

1485
1496
11

10
5
54

1485
11
1496

1875
1496
119

1485
1496
11

1485
1496
11

920

920

Duane at Georgetown

Sept 29.

Begins at about 1465' A.T.

1465' - 1475' 10" - hiatus

L. W. Moore

1475' 10" - 1480' 15" - The upper 3' of this interval have blue grey shales abounding in *Taormenus*. Other fossils are

✓ *C. bellistriata* r

✓ *C. numeratus* c

✓ *P. pennatus* r

✓ *S. chelonicus* r

✓ *P. tenuis* r

P. rana r

✓ *M. canicosa* r

✓ *Par. hainthornii* r

Leptopora sp. r

H. capillaria r

✓ *M. concentrica* r

T. carinatus r

✓ *M. laticosta* r

✓ *P. emarginata* r

✓ *C. scitulus* r

A. umbonata r

✓ *P. radiata* r

C. coronatus r

✓ *P. muta* r

✓ *P. lunulata* r

✓ *P. parvula* r

G. arcuata r

✓ *P. constricta*

C. boothi r

✓ *C. tenuistriata*

S. perplana

B. leda

M. pygmaea

D. submarginata

E. punctata

This shale was rather soft & is blue grey.

1480' 15" - 1485' 20" - same sh.

T. carinatus

C. numeratus

Productella

A. umbonata

C. scitulus

P. vanuxemi

R. fimbriata

This interval is much the same as that one below. *A. umbonata* & *T. carinatus* are more abundant here.

1485' 20" — 1490' 25" — The shale is softer and darker in this interval. Here the *A. umbonata* is most abundant and also *P. rana*. Other abundant fossils are small *Schuchertella* and *Chonetes*. This interval yielded also *H. dehayi*, *E. punctata*, *Silbertoceras* & other crinoids identified by Miss. Eldredge.

1490' 25" — 1495' 30" —

A. umbonata, *P. rana*, *Pholidops*, *O. undulata*. This interval and particularly the top of it has *C. incisa* & *E. perversa* & *P. spiniferoides* & *P. oviformis* & *R. humilis* & *A. reticulata* & *A. decussata* & *A. umbonata*. This horizon was noted also at Doughty.

1495' 30" — 1500' 35" — This interval is the same as that below it but the fossils are becoming less abundant toward the top. *A. umbonata* is quite common. Moreover, as this fossil seems to be as abundant as it is in the western part of the state.

1500' 35" — 1505' 40" — *Trematoceras*, *C. boethi*, *A. umbonata*, *Cyrt. humilis*, *E. perversa*, *Trigona*, *P. fimbriata*, *E. capillaria*, *S. arctostriata*, *C. symphyra*, *P. lineolata*, *Pholidops*, *C. scutellus*, *P. tenuis*, *M. punctata*, *C. incisa*, *E. perversa*, *Cystodictya*, *E. reticulata*, *E. spinosa*, *A. shumwayi*, *C. bellinotata*, *A. perversa*, *P. constata*.

C. tenuistriata, *S. perversa*, *C. mucronatus*,
A. spiniferoides, *R. vanuxemi*
Par. ham., *Caranotocchia* *Crinoides*

1505' 40" — 1510' 45" —

Same lithology — *S. perversa*, *S. perplana*,
S. granulosa, *R. vanuxemi* *Par. ham.*
R. fimbriata, Crinoid stems, *N. triquetra*
A. spiniferoides, *C. scitulus*, *S. perplana*
C. umbonata, *N. oblongatus*, *C. coronatus*,
M. pygmaea, ~~*H. acilis*~~, *Platidops*
C. reticulatus, *P. tenuis*, *P. contracta*,
H. acilis, *Platyceras*, *Pleurocyrtus*,
C. mucronatus, *H. acilis*, *P. rhombus*, *M. fimbriata*
T. exigua, *S. perversa*.

1510' 45" — 1515' 50" — *R. fimbriata*,
Loxonema sp., *C. coronatus*, *R. vanuxemi*,
Tromms, *C. bathy*, *S. perversa*
A. umbonata, *C. scitulus*, *S. perversa*.
S. carinatus,

1515' 50" — 1520' 55" — *S. perversa*, *T. carinatus*
H. delavayi, *Orthoceras* sp.
P. munda, *P. tenuis*, *P. contracta*,
N. bellistriata, *S. perplana*, *C. mucronatus*
C. coronatus, *S. granulosa*, *M. fimbriata*
N. oblongatus, *S. solenoides*, *S. anduchus*
M. contracta, *S. chenuensis*, *S.*
C. tenuistriata, *P. contracta*, *N. triquetra*,
Cyst. ham., *R. vanuxemi*, *A. reticulatus*
Leioptera sp.

The shale here is hard and
 resistant forming one step in
 a cascade.

A. umbonata seems to have
 disappeared at the bottom of this step.

1520'55" — 1525'60" — *C. coronatus*,
B. lida, *P. constricta*, *H. acilis*,
C. boothi, *Goniophora* sp. Fossils
 are rare in this interval except
 in the hard stone at the bottom.

1525'60" — 1530'65" — 72' brings
 us to the bottom of a hard &
 resistant bed 15" thick. Fossils in
 the soft shales for the 7'5" above
 1525'60" are:—

S. pennatus, *M. triguter*, *B. crenistia*,
P. discoidum, *Sch. aben*, *Gensis*,
P. radiata, *Orthoceras* sp., *O. undulata*,
C. boothi, *C. bellistriata*, *C. coronatus*,
Cystodictya, *Leda* sp., *Leopetia* sp.,
P. rana, *T. carinatus*, *P. patulus*, *P. constricta*,
M. oblongatus, *Orbuloides* sp., *B. lida*,
H. dehaugli, *C. bellistriata*, *O. parvula*,
O. carinata, *S. perplana*. Small
 clonetes are by far the most abundant
 fossils here.

1530'65" — 1535'70" — The hard layer is
 about 15" thick and is 2' up in this
 interval. It contains:—

S. granulatus, *S. perplana*, *T. carinatus*,
M. mytiloides, *Gon. humiltoensis*.
 It is a hard calcareo-arenaceous
 rock.

In the sandy sh. on this hard
 layer were seen:—

N. corbuliformis, *O. parvula*,
C. scitulus, *S. pennatus*, *O. undulata*,
S. capillaris, *C. coronatus*, *N. bellistriata*,
B. lida, *M. triguter*, *Lingula* sp.,
P. radiata, *M. pygmaea*, *T. submarginata*.

M. mytiloides, *C. bellistriata*, *P. tenuis*,
Hederella sp., *H. dehayi*, *N. bellistriata*,
L. rostellata, *G. carinata*

1535'70" — 1540'75" — same — *P. constricta*

1540'75" — 1545'80" — same

1545'80" — 1550'85" — the rock here
 is a hard sandy shale with
S. pennatus, *I. carinatus*, *C. mucronatus*,
P. discoidemum, *T. ovum*.

1550'85" — 1555'90" — hard calcareo-
 arenaceous rock making the
 brink of the falls. This stone for
 5' is hard and arenaceous. It has:
R. vanuxemi, *C. scitulus*, *I. carinatus*
 often in calcareous lenses, *S. pennatus*,
S. granulatus. I would correlate this
 layer with the lowest rock exposed
 in the ravine with the Tully at 1544'.

On the ss. rock comes about 11' of blue
 grey shale which has *S. pennatus*,
P. lutea, *N. lirata*, *R. vanuxemi* +
C. mucronatus, *S. capillaria*, *Platyceras* sp.,
P. discoidemum, *A. spiniferoides*, *Cyrtina*
luna, *M. concentrica*, *S. perflava*,
P. rana.

This horizon has many small
 black concretions in it.

1555'90" — 1560'95" — blue grey
 mottled - closely jointed shale not
 favorably exposed for collecting.

1560' 95" — 1565" — 100" — Blue grey
 shales with *M. concentrica*,
S. pennatus, *S. capillaris*, *A. imbricata*,
Orthis sp., *C. scitulus*, *C. mucronatus*,
M. perrinita, *M. oblongatus*, *A. reticularis*,
P. emarginata, *M. concentrica*, *Cystodictya*,
S. capillaris, *Salterella*.

1565' 100" — 1570' 105" — same shale
P. cana, *S. pennatus*, *M. subulata*,
M. trigueta, *I. carinatus*. This whole
 horizon looks like a recurrence
 of that at 1485' 10".

1570' 105" — 1575' 110" — same

1575' 110" — 1580' 115" — Superficial
S. cratellum, *I. carinatus*, *C. scitulus*,
I. exigua, *P. cana*, *S. pennatus*,
C. mucronatus, *C. imbricata*, *M. concentrica*,
Camerothea sp., *P. costata*,
A. spiniferoides.

1580' 115" — 1585" 120" — The beginning
 of this step is in 2 layers of sh. b.
 One, the lower is 8" thick, the upper
 5". This contains enormous
 numbers of *S. pennatus* in both
 layers, it is succeeded by about
 3' of dark shale with the following
 fossils: — *P. emarginata*, *I. carinatus*,
S. pennatus, *L. latra*, *C. beltrata*,
M. hiata, *A. spiniferoides*, *S. tellus*,
I. subemarginata. The shale here
 is dark with a reddish rust, it
 is exactly like the *L. laura* band
 noted in the ravine with the
 valley at 1644.

The shale is somewhat like the Senessee but appears coarser, also coarser than that in the other row.

1585' 120" — 1590' 125" — One foot above the top of this last interval comes a 6" ss band terminating temporarily the *Leiorhynchus* band with a hiatus above the 6" of ss.

50

ss 6"	
sh with	
L. lumen 5 1/2" 52" ?	
S.S. 13"	

1590' 125" — 1595' 130" — hiatus

1595' 130" — 1600' 135" — bluegrey shale with *M. liata*, *P. costata*, *T. submarginata*,

1600' 135" — 1605' 140" — same in bank — no collecting — hiatus in stream

1605' 140" — 1610' 145" — hiatus

1610' 145" — 1615' 150" — hiatus

1615' 150" — 1620' 155" — "

1620' 155" — 1625' 160" about 2' up in this horizon there is a layer of calcareo-arenaceous sand, in places rather pure ls. with *S. punctatus*, *R. variegatus*, small black concretions

O. curvatus. This stone becomes fluted thru solution & looks like the *Quarry* externally. The shale on this is rather sandy & has *O. curvatus*, *Trommsdorffia*, *Aviculopecten*. This probably represents the Georgetown Quarry horizon.

1625' 160" — 1630' 165" — about 2' of coarse arenaceous shales at the bottom & 3' of hiatus. *C. bellistriata*, *T. curvatus*, *Crin. hamiltoniae*, *A. sprifer*, possibly *marcyi*?

1630' 165" — 1635' 170" — a few patches of arenaceous shales but they cannot be collected. A hard but thin layer (2") of calcareous ss. exists in the middle of this interval.

1635' 170" — 1640' 175" — At the very bottom of this interval the shales become soft again. They have in this interval:

S. pennatus,
T. submarginata,
C. bellistriata

Fossils are rare in this interval

1640' 175" — 1645' 180" — *S. pennatus*, *L. fauna*, *M. corbuliformis*. Concretions are not uncommon in the rock here.

C. tenuicostatus, *M. oblongatus*. The rock here is much water-soaked and very difficult to extract fossils from it.

1645' 180" — 1650' 185" — I could only locate *S. pinnatus*, *P. decimatus*, *J. carinatus*. Rock poorly exposed for collecting.

1650' 185" — 1655' 190" — *L. laura*, *C. baxteri*, *C. tenuistriata* (bellistriata?), *S. crotatum*, *A. erectum*, *M. bellistriata*, *P. emarginata*. In the upper 2' of this step *L. laura* is not seen.

1655' 190" — 1660' 195" — most of this is a fall but at the top of the step the following were seen: —

A. reticularis
P. varrucensis
C. bellistriata
S. pinnatus ? c
P. patulus
P. fimbriata
S. concava

C. tenuistriata
C. complanata
M. concentrica
S. pinnatus
M. varrucensis
V. pustulosa

1660' 195" — 1665' 200" + 6"

Height of Tully from road is 1665' + 17' = 1682' A.T. for bottom of Tully.

Fossils in the last interval are: — *S. pinnatus*, *S. tellus*, *S. pinnata*, *M. striata*, *M. bellistriata*, *Leiopteria* sp. Very unfavorable for collecting. Lower layer of Tully there is granular *C. bellistriata*.

Hint: — Quarry at Georgetown — Lebanon line probably represents the rocks above the sandy layers with abundant *J. carinatus*, those seen above first rocks at Ravine with Tully at 1645

October 1.

Ravine west of Blair's, along the road.

Hand levelling begun at 1400'

1400' - 1480' 80" - hiatus. If there were any Tademore here it should have come at about 1455' A.T. The first rock in this ravine comes at 1480' 80".

1480' 80" - 1485' 85" - The rock in the interval is a soft, bluish green shaley, sandy brown on the surface in places and breaking into irregular lumps. Fossils are:

C. scitulus c*M. corbuliformis**A. umbonata**P. rana**C. mucronatus* c*C. tenuicinctus*

This appears to me to be a part of either one of the *Ammonoidea* zones or one of the *Chonetes* zones.

1485' 85" - 1495' 95" - same.

1495' 95" - 1500' 100" - *P. maxima*, *P. carinata*, *L. ovalis*, *S. pinnatus*, *C. mucronatus*, *P. costatus*, *P. tenuis*, *P. elongatus*, *C. bellistata*, *S. papilion*, *P. rana*, *M. bellistata*, *P. harringtoni*.

1500' 100" - 1505' 105" - *C. bellistata*, *P. costatus*, *S. pinnatus*, *D. arcuata*, *I. sinuatus*, *A. umbonata*, *M. corbuliformis*, *P. radiata*, *S. papilion*, *H. oculis*, *G. capillaria*.

1505' 105" - 1515' 115" - same rock.

At about 1515' 115" the ravine forks. At the fork the following were seen: - *P. corbuliformis*, *P. harringtoni*, *S. pinnatus*, *S. granulatus*, *A. sinuatus*, *M. concentricus*, *P. rana*, *I. sinuatus*.

1515' 115" — 1520' 120" — same

1520' 120" — 1525' 125" — *A. umbonata*

1525' 125" — 1530' 130" — *R. vanuxemi*
M. concentrica, *T. carinata*,

1530' 130" — 1535' 135" — similar sh.

1535' 135" — 1540' 140" — *C. tenuistriata*. Rock
 in general less fossiliferous

1540' 140" — 1545' 145" — This interval is
 capped with a calcareous arenaceous
 shale band with *R. vanuxemi* + *T. carinata*

1545' 145" — 1565' 145" — a harder more
 arenaceous shale forming a escarpment.
 Above this the valley flattens very
 perceptibly. This ravine was very
 hastily examined as the small exposures
 in it did not warrant careful
 examination. I did see, however enough
 to convince me that the lower part
 of this ravine is similar to the lower
 part of the ravine at Georgetown.

Oct. 1'

Exposure below dam on Morgan's property on Stone Mill Brook.

The exposure just below the dam consists of coarse ss. that are very hard and apparently form a flat which formerly flooded the pond which has now disappeared. The rocks in this exposure for the most part are arenaceous shales of a blue grey color:—

Fossils:—

P. flabellum
M. concentrica
C. tenuistriata
Goniophora sp.
P. tenuis
O. undulata
N. triquetra

J. carinatus c
Pal. emarginata
S. pennatus
N. oblongatus
C. coronatus
S. cheunungensis
Pal. constricta
P. sectifrons

In the stone under the dam, which is a coarse and rather massive sandy stone *S. pennatus*, *C. complanata*, *J. carinatus*, *P. flabellum*, ^{*A. erectum*} are rather common.

This exposure I believe is quite definitely Ludlowville 16' of rock are exposed

Oct 1²

About 1420' A.T. ss. with *S. pennatus*, *J. carinatus*, Undoubtedly the same as at top of dam at Oct. 1'

Beneath these are rather soft blue grey shales with

C. scitulus cc
J. subemarginata
L. ligea
Lingula sp.
P. lanceolata

O. undulata
N. oblongatus
J. carinatus
N. lirata
S. pennatus

The upper ss. at about 1420' have the same faunal assemblage as the rocks at the dam at Oct. 1'.

M. concentrica c
P. flabellum re
C. coronatus re
H. deKayi

S. pennatus c
T. carinatus cc
C. scitulus
A. princeps
S. perplana

The soft blue grey shales occur about 20' below the upper ss., or at about 1400'

Additional fossils in the lower soft shales are:-

A. erectum
P. constricta
N. bellistriata
B. crenistria
O. carinata

M. pygmaea
O. parvula
Stannysia sp.
P. nodocostata

This horizon has every appearance of the one that rests on the *Pholidostrophia* bed at Erieville.

These are exposed down to 153 paces from the juncture of this gully with Stone Mill Brook.

Oct. 1st.

Ravine in the village of Lebanon
Hand-levelling begun at 1355' A.T.

1355' — 1425' 70" — hiatus

1425' 70" — 1440' 85" — about 15' of sandstone
and sandy shales. The following fossils
were found here:—

✓ <i>I. carinatus</i> cc		<i>A. princeps</i>
✓ <i>S. pennatus</i>	<i>S. bisulcata</i>	<i>M. concentrica</i>
✓ <i>S. granulatus</i>		<i>C. boothi</i>
✓ <i>Platyceras</i> sp.		<i>J. exigua</i>
✓ <i>P. flabellum</i>		✓ <i>Cyrt. hamiltonensis</i>
<i>Hederella</i>		<i>A. erectum</i>

This list is from about 1425'.

Fossils at about 1440' 85" are:—

✓ <i>S. granulatus</i>	✓ <i>S. pennatus</i>
<i>M. mytiloides</i>	✓ <i>S. perpallana</i>
<i>P. muta</i>	✓ <i>R. vanuxemi</i>

The middle and lower part of the
exposure are sandy shales and ss; the
upper part is calcareo-arenaceous. and
fossils are hard to collect.

A loose slab of ls. composed almost
completely of shells is somewhat like
the ls (Tichenor) seen at Fabius.

In the stream:—

1425' 70" — 1435' 80" — calcareous sandstones
and ss. The calcareous stone at
about 1435' 80" —

Here were seen:—

<i>I. carinatus</i>	<i>Schuchertella</i>
<i>S. pennatus</i>	<i>Productella</i>

1435' 80" — 1440' 85" — The lower 3' of this interval are ls., shales & calcareous sh. Lenses of ls. with abundant fossils occur occasionally. The upper layers are hard calcareous sh. The one ls. lens seen could not be collected. It contained a cup coral.

P. emarginata was seen here.

S. pennatus

T. carinatus

1440' 85" — 1445' 90" —

On these calcareous shales ^{+ ls} come softer shales ^{+ ls} of a blue grey color, these have *T. carinatus*, *S. pennatus* and *C. scitulus*.

1445' 90" — 1450' 95" — 2 patches (small) of these shales which could not be collected

1450' 95" — 1455' 100" — *linatus*

1455' 100" — 1460' 105" — blue grey shales

G. arcuata, *C. scitulus*

N. linata

C. vicinus

Epyrocerus sp.

A. umbonata

O. bellistriata

M. mytiloides

H. capillaria

N. eduliformis

1460' 105" — 1465' 110" — same sh.

A. umbonata

H. capillaria

C. coronatus

T. carinatus

Cystodictya

1465' 110" — 1470' 115" — *Clonetes* is very abundant about 1' below the top of this interval

1470' 185" — 1475' 120" — same shale — a very thin band of ls sandstone came in here about 1' below the top.

1475' 120" — 1480' 125" — Bully ends 4 steps above 1475' 125" or at 1512' A.T. It still ascends but is very gentle.

I believe that all of these shales belong to the Moscow and also about 5' of the calcareous sandy shales that rest on the sandstones with *P. flabellum* and abundant *J. carinatus*. It seems to me that the Moscow comes in with the calcareous sandy shales & ls. with the coral. Of these there are about 5 or 6'. The Moscow-Fallowville line comes at about 1437' A.T. or there about.

Fossils noted between 1480' 125" & 1512'.

<i>S. pennatus</i>	<i>Tripoterna</i> sp.
<i>C. scitulus</i>	<i>P. radiata</i>
<i>C. bellistriata</i>	<i>P. munita</i>
<i>P. umbonata</i>	<i>C. indenta</i>
<i>C. coronatus</i>	<i>H. corbuliformis</i>

Some fossils found in the calcareous stone ls. would refer to the lower Moscow —

<i>P. emarginata</i>	<i>A. princeps</i>
<i>A. discosata</i>	<i>A. terebratulif</i>
<i>J. carinatus</i>	<i>E. cyclops</i>
<i>J. granulosa</i>	<i>C. parvulus</i>
<i>J. granulosus</i>	
<i>C. bellistriata</i>	
<i>H. vanuxemi</i>	

~~Sept~~
Oct. 4.

Day

1st step above sandy-calcareous
"Tachon" - rock abruptly becomes a soft
bluish shale in which *S. pennatus*,
is abundant. Also small *Chonetes*.
Characteristic forms are *Leptæna*,
B. leda, *P. patulus*, *B. bisulcata* - These
all were seen at ^{Derry}~~Tachon~~. Indeed
this step is identical to that at ~~Tachon~~
Derry.

1st - 2nd. - practically all covered
only two patches of shale which is rather
hard here. These could not be collected.

2nd - 3rd step - small *Chonetes*, *A. umbonata*,
Murex, *Murex*, *C. coronatus*. shale soft.

3rd - 4th - *A. umbonata*, *Murex*,
sp. Fossils here do not seem abundant
except for collecting *B. leda*
S. pennatus.

4 - 5 - *Chonetes* abundant shale
lucy with its shells.

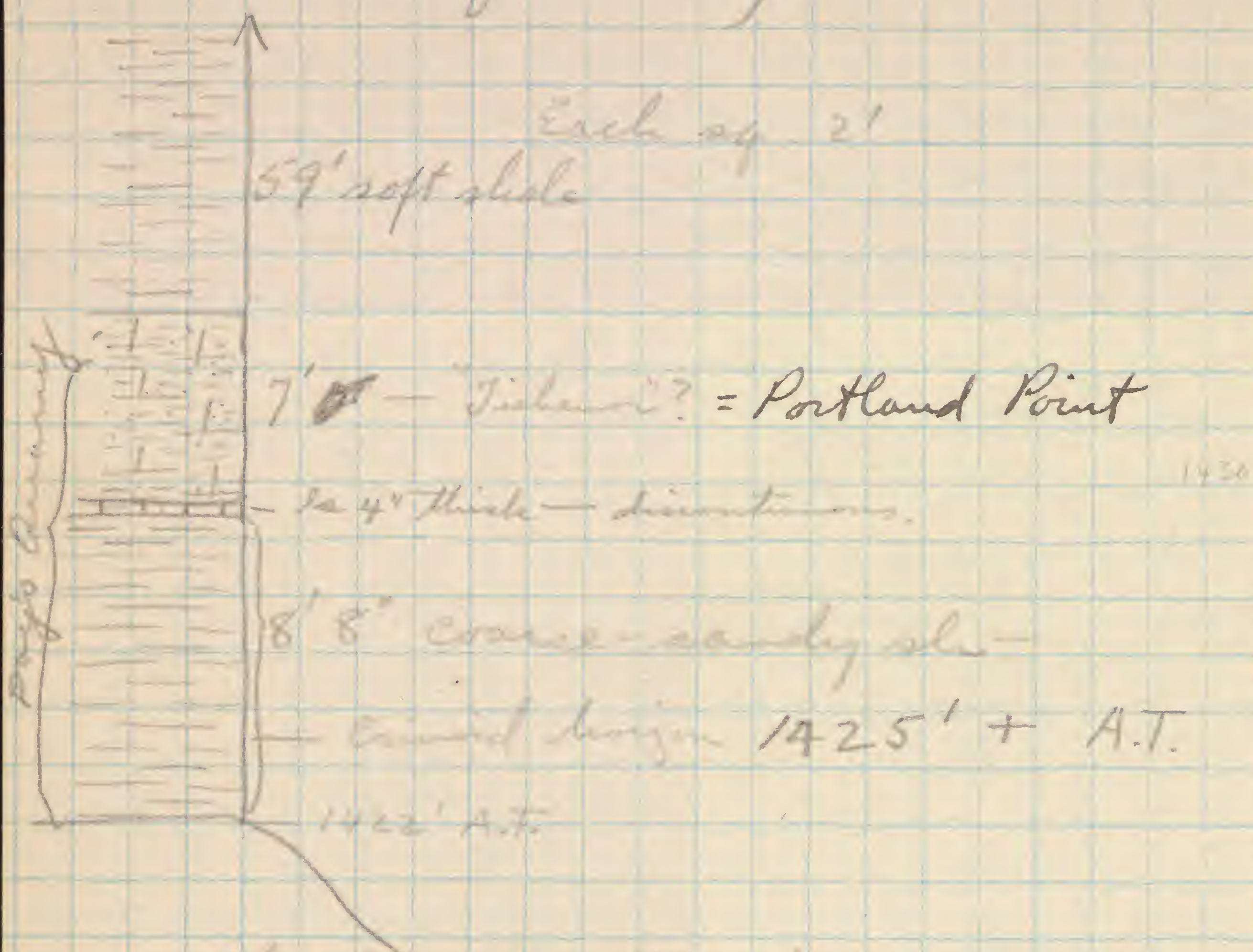
5 - 6 - similar - *P. lanceolata*.

6 - 7 - unfavorable to collecting.

7 - 8 - *A. umbonata*, *M. pygmaea*,
M. elongatus, *Chonetes* that
abundant.

These shales go up to 11 steps.
C. induta was found at 10.
Where *P. lanceolata* was found
must be the bottom of Moore's
Ravine. *A. spiniferus* first
seen at 10.

Day's Quarry Lebanon



The lower stone is a coarse sandy sh - blue gray in color - fossils are common in layers. Most abundant is *T. carinata*. *P. flabellum* is common. The layers bearing fossils are usually thin and sometimes calcareous. The fossils are often in lens-like masses. The stone here is not a ss.

Above these coarse shales there are $7\frac{1}{2}'$ of limy sandy shales in striking contrast to the rock below. This rock is tough and very hard, breaking with difficulty into irregular lumps. The shale below is brittle & splits readily into flat thin slabs. *Rhipidomella* is rare in the shale below but common in the upper stone. The shell ls. at the base of the upper stone may be the Tisham but it appears to me to be discontinuous.

A short distance upstream there is another exposure which shows $6\frac{1}{2}'$ of this shell ls. It is therefore probably a continuous layer.

This exposure is also in the bank of the stream. In another place the layer in this exposure the layer is 8" thick. Probably it is about 9 or 10" in thickness. It is not exposed here in its entirety.

This ls. is not exposed in the stream-bed

Quarry outside of Lebanon is the Beach Quarry.

7 steps from last exposed rock in gully to dwelling of E. C. Day its owner

Oct. 5.

Blair's Ravine

Hand-leveling begun at 1400' A.T.

1400' — 1435' 35" — hiatus

1435' 35" — 1440' 40" — at the very bottom of this step — bluish grey sandy shales with *T. carinatus*, *B. creinstria*, *P. lanceolata*, *Spirifer* cf. *tellus*, *S. andraeulus*, *P. flabellum*. I believe that this shale belongs to the upper part of the Ludlowville — about 1' is exposed at the very bottom of this interval. In the bed of the stream in this interval a slab of shell ls. was seen just like that at Stourd's Quarry at Lebanon. The name of the Lebanon quarry is Stourd's & not Day's for Day only owns the upper part of the gully. A foot of blue grey shales with *Rhynchonella*, *Tropidoleptus* are on top.

1440' 40" — 1445' 45" — The stone on this is a tough calcareous — arenaceous shale with *C. bellistriata*, *T. carinatus*, *S. gemmatus*, *S. pappus*, *R. Vanuxemi*, *Cranella* hem.

I noticed in contact with the shales here no ls composed of shells, but the shale in the last foot of 1440' 40" carries a shell suspiciously like *V. pustulosa* and may easily be. There is a contrast in the weathering of the two rocks, the calcareous arenaceous kind above being much more resistant. About a foot above the contact of the two kinds of rock was found a layer that has considerable shell ls. This horizon must represent that at Stourd's quarry in Lebanon, but the ls at the base, here cannot be demonstrated. It must be discontinuous.

Each square 55'

listens

19 35' 35"

Stone is exposed here for only about 3'. The ls. in the collection is from about the middle of the 3'.

1445' 45" — 1450' 50" — hiatus

1450' 50" — 1455' 55" — hiatus

1455' 55" — 1460' 50" — hiatus

1460' 50" — 1465' 55" — a small patch of soft bluish sh.

1465' 55" — 1470' 20" — bluish gray shales, soft, mottled.

Fossils:

For. lam.	<i>S. cf. arenata</i>
<i>S. capillana</i>	<i>Cyrtolites</i> sp.
<i>C. coronatus</i>	<i>B. leda</i>
<i>R. vanuxemi</i>	<i>S. arctostriatus</i>
<i>S. pennatus</i>	<i>M. corbuleformis</i>
<i>C. scitulus</i>	<i>P. radiata</i>
<i>M. pygmaea</i>	<i>P. nana</i>
<i>C. tenuistriata</i>	<i>C. mucronatus</i>
<i>A. umbonata</i> cc (at top of interval)	
<i>Triglophus</i> sp.	

C. mucronatus must be a high bryozoan in abundance.

1470' 20" — 1475' 25" — same sh.

S. pennatus c, *A. umbonata*, *C. coronatus*, *C. scitulus*, *P. contracta*, *C. mucronatus*, *For. lam.*, *M. trigonatus*, *P. radiata*, *P. subulana*, *C. tenuistriatus*, *C. boethi*.
Chonetes outcrops *ambococha*.

1475' 75" — 1480' 80" — same — poorly exposed

1480' 80" — 1485' 85" — hiatus, in stream — boulders not collectable. A small ledge in the stream yielded: — *S. pennatus*, *C. mucronatus* c.,
~~1485' 85" — 1490' 90"~~ *P. planus*, *A. umbonata*,
Pal. constricta, *C. scitulus*, *P. radiata*
S. perversa

1485' 85" — 1490' 90" — hiatus

1490' 90" — 1495' 95" — *C. scitulus*, *S. pennatus*,
A. umbonata.

1495' 95" — 1500' 100" — *A. umbonata*,
S. pennatus, *C. scitulus*, *C. setigenus*,
I. submarginata —

1500' 100" — 1505' 105" — somewhat harder sh. —
Pan. ham. *P. radiata*
C. bellictriate c. *Pholidops*
S. perplura *Orthoceras* sp.
P. tenuipetens

1505' 105" — 1510' 110" —

<i>C. bellictriate</i>	<i>N. hiata</i>
<i>N. bellictriate</i>	<i>A. spiniferoides</i>
<i>S. perplura</i>	<i>M. concentrica</i>
<i>S. pennatus</i>	<i>S. granulatus</i>
<i>C. mucronatus</i>	<i>C. indenta</i>
<i>N. lamellata</i>	<i>R. camperi</i>
<i>Pan. ham.</i>	<i>P. rara</i>

I. carinatus c.
A. umbonata re
P. tenuis
P. constricta
Aviculopora sp.
Orbiculoides sp.
P. radiata
S. spallaria

Shales here are hard
 & somewhat calcareous
 forming a cascade

1510' 110" — 1515' 115" — hiatus

1515' 115" — 1520' 120" — Ambocoelia still present — shale not favorably located to collect.

1520' 120" — 1525' 125" — hiatus

1525' 125" — 1530' 130" — *M. concentrica*, *A. umbonata*, *C. mucronatus*, *E. carinata* — *Pholidops*, *R. fimbriata*

1530' 130" — 1535' 135" — *E. punctata*, *Plithonia* sp., *S. pennatus*, *P. rana*, *C. tenuistriata*, *Productella* sp., *C. boothi*

1535' 135" — 1540' 140" — *P. constriata*, *Cyrt. ham.*, *Taomurus*, *S. granulosus*, *S. pennatus*, *C. tenuistriata*, *Productella*, *R. fimbriata*, *C. bellicata*, *M. pygmaea*, *P. patulus*, *P. rana*, *P. tenuis*, *R. vanuxemi*, *A. umbonata*

1540' 140" — 1545' 145" — same

1545' 145" — 1550' 150" — *M. mytiloides*, *B. leda*, *Rensselairella*, *I. cuneatus*, *Cyrt. ham.*, *R. fimbriata*, *S. pennatus*, *C. bellicata*, *C. tenuistriata*

Only about 1' exposed — hard sh.

1550' 150" — 1555' 155" — hiatus except for 2' at the top — which have: *S. pennatus* — very unfavorable for collecting.

1555' 155" — 1560' 160" — hiatus

1560' 160" — 1565' 165" — There comes at the bottom of this interval a cascade about 10' high. *B. lida*, *I. carinatus*, *P. emarginata*, *S. pennatus*, *M. bellistriata*

1565' 165" — 1570' 170" — hard rock with *C. bellistriata*, *M. carinata*, *M. concentrica*, *I. carinatus*, *S. pennatus*, *R. wampeni*, *S. granulatus*. This rock is very hard & may correlate with the hard layers above the Ambrosia zone at Moore's Ravine.

1570' 170" — 1575' 175" — On the brink of the cascade which is 1' above the bottom of this step *S. per plana* is common in the sandy shales. Above the layer with *S. per plana* are sandy shales with: *E. lincklaeni*, *S. pennatus*, *I. carinatus*, *C. muricata*, *S. angulatus*, *Productella* sp. At the top of this step the ravine comes out into the open.

1575' 175" — 1580' 180" — sandy stone forming the very top of the ravine in the open — about 2' of stone
S. granulatus
P. bruta

I. carinatus
The very top stone is hard, 6-7" thick, tough and with an irregular fracture.

1580' 180" — 1640' 240" — hiatus

1640' 240" — 1645' 245" — rock composed of very coarse sandy shale with

some rather coarse ss. Fossils are rare: - *S. pennatus*, *S. granulatus*.

1645' 245" - 1650' 250" - hiatus

1650' 250" - 1655' 255" - Coarse sandy rocks, which must belong somewhere near the Georgetown Quartz horizon

1655' 255" - 1660' 260" - same for three feet but with *S. pennatus*, *A. spiniferoides*, *T. carinatus*, *S. tullius*, *H. dekeyi*, *Pholidops*, *P. emarginata*. At the top are about 2' of soft gritty sh. but I found no fossils

1660' 260" - 1665' 265" - hiatus

1665' 265" - 1670' 270" - hiatus

1670' 270" - 1675' 275" - grey weathered sandy shales with: - *D. pustulosa*, *S. tullius*, *T. carinatus*, *R. fimbriata*, *P. rana*, *M. concentrica*, *T. exigua*, *R. vanuxemi*, *Strophodontia* sp. These are mostly from loose slabs. *L. laura* occurs in the middle of the interval

1675' 275" - 1680' 280" - *T. carinatus*, *S. tullius*, *P. emarginata*, *R. fimbriata*, *R. vanuxemi*, *S. pennatus*, *S. inaequistriata* -

1680' 280" - 1685' 285" - to bottom of Tully. Thus Tully is at 1709' - Moscow = 1. About 20' of Tully are exposed. It is very shaley. 6 steps above the Tully a small exposure of grey, thin ss is seen which is the Sherburne,

The Genesee appears to be quite thin. Only a small patch of Genesee is exposed in places. At about 1750' A.T. Shales form the flat, but I don't believe that they are the typical Genesee shales. It appears to me that the Genesee is only 30' thick here.

I believe that I am about 10' too high on the Tully location. The upper part of the Blair ravine according to Mr. Blair is the Ballard ravine.

If one works down from the head of the ravine, the bottom of the Tully must be at 1785' A.T. as there is 20' of Tully and 32' up to the bottom of the first ss and 10' of ss & shales making about 62'.

The Tully is very shaly, but the calcareous shales weather much like ls.

The only observed Genesee in place was 8' above the Tully.

The Sherriner consists of ss & sh. a ss forming the flat in the valley on the hilltop.

I believe about 5' of Tully are missing as the bottom beds are very shaly. I saw few fossils, small corals.

L. luma is about 15' below the Tully.
V. pustulosa about 10'.

14 steps below the Tully are shales with *L. luma*, *A. ashiifera*. About 5' vertical. 15 steps below there is a ss ledge about 1' thick. Such a layer was noted between shales with *L. luma* at Moores and the other Georgetown ravine.

L. lama was also seen in a few inches of shale below this layer.

At about 16 steps below the Gully a 6" layer of calcareo-arenaceous rock has *L. lama* & *S. pinnatus*, with other fossils.

21 steps were covered from bottom of Gully to 1580 - 180" - This would mean that the bottom of the Gully is at 1685. This is in accord with the measurement down from the top of the Gully adding 285" - gives 1704" to bottom of Gully.

The gully from the top actually swings west to run down into Butte.

Down to 1465' 65" there are 42 steps =
 $1675' 275" = 1698'$ from bottom of Gully to top

Oct. 5 - a joint face exposure 30 yds long by 15' high of slaty, sandy rock - apparently an old quarry - 20' above the quarry are coarse sandy shales.

Oct. 5

Revisited

Coarse sandstones revealed along a large joint face. Fossils are preserved in ~~large lenses~~ which are a shell ls. Fossils present are:

<i>Camerozoechia</i> sp. cc.	<i>Denticulites</i> sp.
<i>Spirifer</i> sp. cc.	<i>C. coronatus</i>
<i>P. flabellum</i> r.	
<i>S. granulatus</i>	

There are about 20' of the ss exposed. The ss is not predominately slabby as in the H. Quarry but breaks in heavy clumps.

10' above the top of the ss, about 5' of hiatus intervening, there are sandy shales of irregular fracture with the following fossils:

<i>S. pennatus</i> cc.	<i>L. rogersi</i>
<i>I. carinatus</i> c.	<i>C. coronatus</i>
<i>M. concentrica</i>	<i>A. exatum</i>
<i>S. cf. audaculus</i>	<i>Cyclonema</i>
	<i>S. pectinata</i>

The lowest stone in the 5' of sandy shales exposed was a ss. and this contained the *L. rogersi*.

The ss appears to me to belong to those along the West Gate of Georgetown Road and in the D. Ravine visited Oct. 9. The rock is exposed 27' above the level of the road.

Oct 6

Small exposure in road, grey arenaceous
shales, tough with *S. pennata*, *S. cuneata*,
S. subcuneata, *S. chuchertella*, *Avicula* sp.,
H. deKayi, *Rhipidomella* sp., *P. flabellum*,
M. subulata, *M. corbuliformis*,

Randalsville Gorge

At and below the dam are found the
sand and shales of the U. Quarry group.
The layer of concretions occurred at about
1220' A.T.

Just below the crinoidal to line which
is about 4" thick there is a calcareous sand
stone, the thickness of which cannot be
determined. Crinoidal stone at 1288' A.T. ~~1178~~

At ~~1158~~ were seen the top of thin
bedded cross-bedded ss. referred to
the U. Quarry. Apparently the Red Gate
horizon is not exposed. By topography
this outcrop would be located at 1270' A.T.
The ss of the U. Quarry are 27' below
the crinoidal stone or at 1244' A.T. The
Red Gate stone does not appear. This
probably does not represent the very
top of the U. Quarry. Below the concretionary
bed around the dam are coarse
shales & ss with few fossils. Below
the dam are heavy beds of ss. and
some shales, one doubt representing
the beginning of predominance of
the ss.

287' above dam in stream bed are
sandy shales weathering purple with
many *S. pennata* etc.
287' point - same. About half

way between this & the 283 pace was
a 9" layer of ss.

Fossils there are:

S. pennatus cc

C. mucronatus

C. oculus

P. flabellum

Grammysia sp.

C. induta

620 paces from the dam is a dump
apparently where fossils were gained
from the low walls along the ravine.
On the slope in the dump *S. laevis* is
abundant, *C. induta* is present. This
stone must be below the U. Quarry.
Sphenotus, a large bryifer - see thesis.
Lithologically the walls are like the
stone (green) in the dump. *T. carinatus*
N. corbuliformis

825 paces to first ravine - handlevelling at
1220' A.T.

1220' - 1265' 45" - liat.

1220' 00" - 1266' 45" - thinly laminated ss of U.
Quarry for about 1' at top of the interval

1265' 45" - 1270' 50" - same.

1270' 50" - 1285' 65" - same in patches,
layers thicker toward top. At top of
interval there is a flat in the stream
suggesting the laminated (bed. ss)
which should

1285' 65" - 1315' 95" - hiatus

1315' 95" - 1320' 00" - shales of Earlville
blue grey shales.

1320' 00" - 1330' 00" - shale becoming sand
with some ss in the stream bed.

On side slope at 1365' 145" - come out

First Raine

1365' 145'

limestone

7
11

limestone

blue grey
sh.

limestone

limestone

ss, sh - shall. to
5'

sandy sh.

slabby ss
W. Quarry

19
5
95
8
103
20
123

ss

1365'

limestone

1320' A.T.

5' 5" each sq.

coarse slabby ss. with *Camarotoechia* sp.

These are ripple-marked in places

Between 1365' 145" and 1410' 190" - occur 3' of shales which are arenaceous. On the slopes of the gully there are innumerable ss. Slab

At 1415' 195" - comes about 5' of ss with shales + ls. The latter made up completely of shells of

L. tellus ?

Camarotoechia

L. granulosa

T. carinatus

C. coronatus

H. deKayi

Leiopteria sp.

Strophodontia sp.

This material is in the form of lenses. There is also considerable black shale that breaks into flat flakes between the ss. The whole exposure is about 5-6' high.

Some of the shell ls. are 1 1/2' thick + contain some masses of black shale.

The first ss. seen is about 35' above the blue grey shales (Earlville)

In the second gully there are ss that have on them bluish shales probably of the Earlville horizon. The top of these ss. is at 1326' They may be the Red Gate ss.

Exposure below dam at Kingsby Brook Reservoir:

1' of coarse ss with:-

A. bellulus

Camarotoechia sp.

A. erectum

P. flabellum

T. carinatus

C. coronatus

H. deKayi

At the bottom of the layer there are ripple-marked. There are ls or calcareous lenses with many individuals of *Trypidoleptus*, *Homolonotus*, *Spirifer*. Fossils are nowhere very abundant. These layers must represent the U. Quarry.

There are 35' of sandstones exposed here. The top 3' are of sandy shale and have *Camarotoechia* sp., *P. flabellum*, *Aviculopecten*.

Oct 6²

shales along Creek at west end of reservoir. The grey & very suggestive of the Earlville shales.

I could not place the ss under the dam. The top of them must be at about 12³⁰' A.T. and the Red Gate sequence must occur here but be unexposed.

It strikes me as peculiar that 15' or so of hard rocks like those of the Red Gate should not be exposed. The ss in the second ravine (one nearest the Reservoir) may belong to the Red Gate horizon as not more than 5' intervened between them and the blue-grey shales.

The ss below the dam appear to differ from the U. Quarry stones in not abounding in *S. pennatus*, of which we found none, but our collecting was of short duration. The large *Actinodonta* however were like those of the U. Quarry.

An *S. denissa* was found in the stream debris in the first gully, suggesting that this occurs higher up.

Roadside Slope

$$\begin{array}{r} 1270 \\ 14 \\ \hline 1256 \\ 1243 \\ \hline 23 \end{array}$$

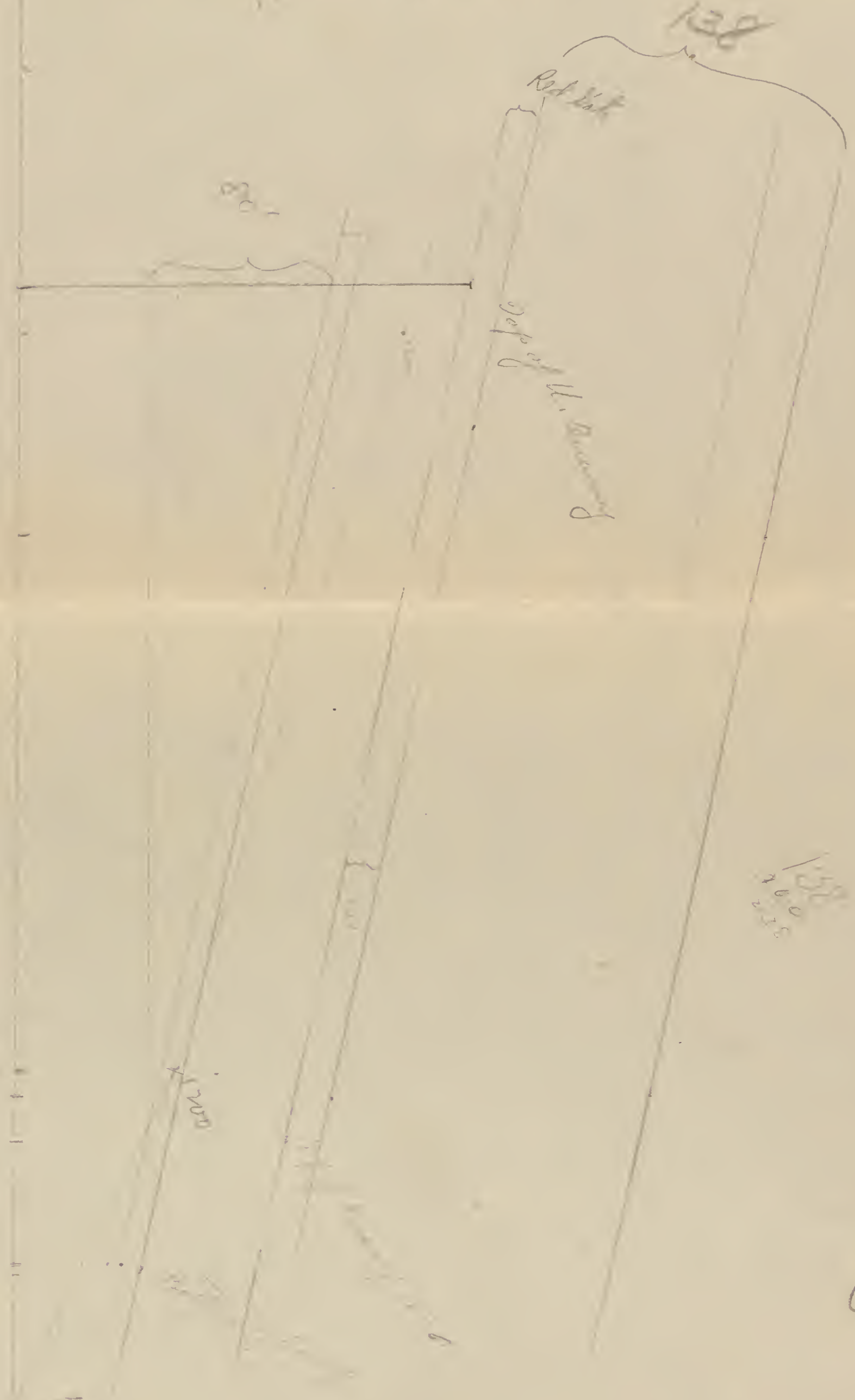
$$\begin{array}{r} 1270 \\ 14 \\ \hline 1256 \\ 1243 \\ \hline 23 \end{array}$$

$$\begin{array}{r} 1270 \\ 14 \\ \hline 1256 \\ 1243 \\ \hline 23 \end{array}$$

$$\begin{array}{r} 1190 \\ 71 \\ \hline 19 \end{array}$$

$$\begin{array}{r} 1200 \\ 1400 \\ \hline 1800 \end{array}$$

$$\begin{array}{r} 24 \\ 1130 \\ \hline 1344 \end{array}$$



Low road drain E of strands

$$\begin{array}{r} 65 \\ 11 \\ \hline 45.5 \end{array}$$

$$\begin{array}{r} 65 \\ 314 \\ \hline 260 \\ 2210 \end{array}$$

$$\begin{array}{r} 27 \\ 34 \\ \hline 308 \\ 2619 \\ \hline 262 \end{array}$$

$$\begin{array}{r} 148 \\ 135 \\ \hline \end{array}$$

$$\begin{array}{r} 1457 \\ 1420 \\ \hline 27 \end{array}$$

$$\begin{array}{r} 138 \\ 157.5 \\ \hline 1581 \\ 117 \\ \hline 275 \end{array}$$

$$\begin{array}{r} 65 \\ 775 \\ \hline \end{array}$$

$$\begin{array}{r} 370 \\ 115 \\ \hline 385 \\ 1120 \\ \hline 1340 \\ 117 \\ \hline 292 \end{array}$$

$$\begin{array}{r} 05 \\ 115 \\ \hline \end{array}$$

$$\begin{array}{r} 1200 \\ 1120 \\ \hline 1120 \end{array}$$

$$\begin{array}{r} 1457 \\ 134 \\ \hline 319 \end{array}$$

$$\begin{array}{r} 1190 \\ 1120 \\ \hline 1120 \end{array}$$

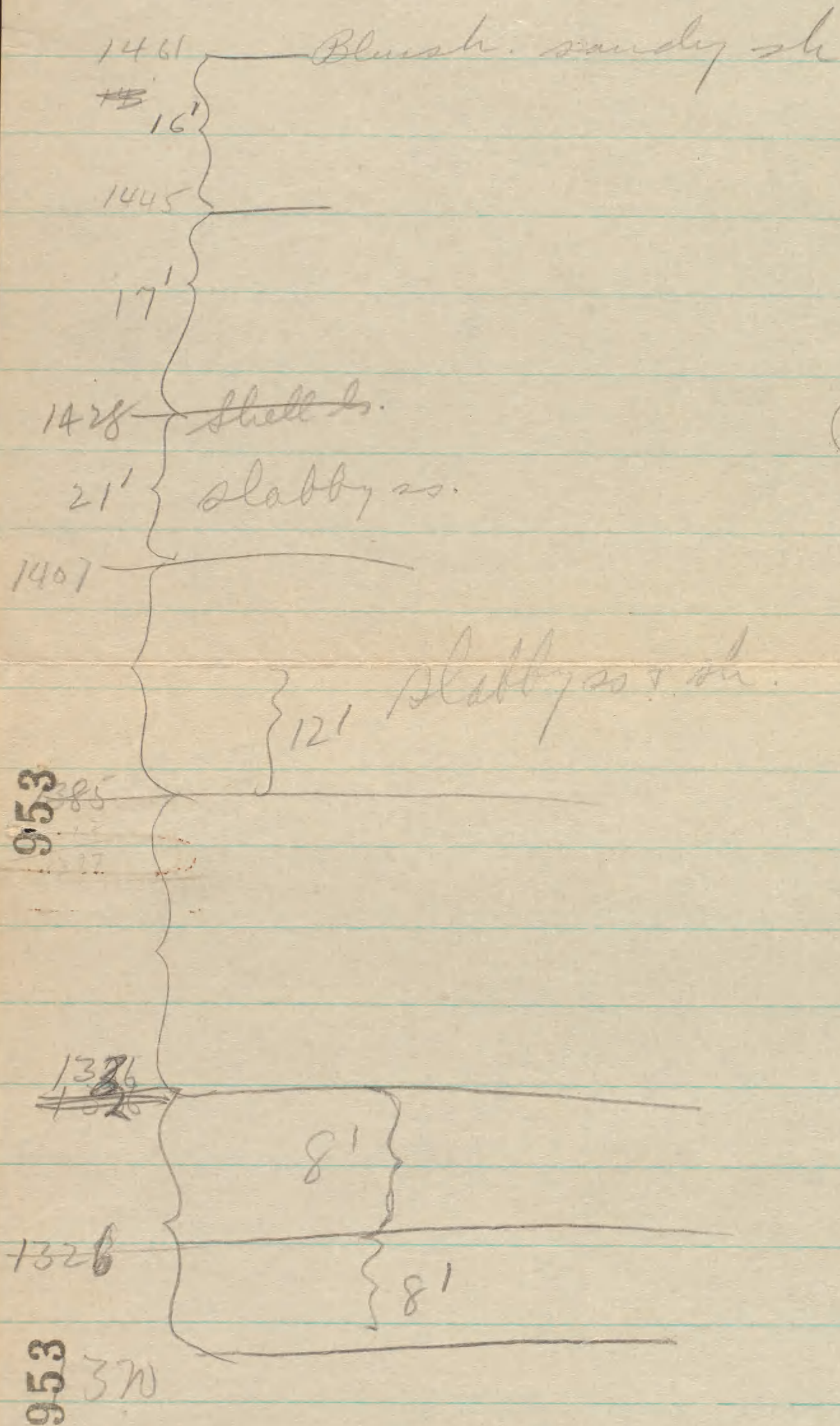
$$\begin{array}{r} 113 \\ 113 \\ \hline 226 \end{array}$$

$$\begin{array}{r} 114 \\ 114 \\ \hline 228 \end{array}$$

$$\begin{array}{r} 1457 \\ 127 \\ \hline 127 \end{array}$$

$$\begin{array}{r} 117 \\ 117 \\ \hline \end{array}$$

West Ravine



39

140
117
157'

1445
1320
125
111
242

Ravine east of ~~Days~~
Shoals

Oct. 7.

Hand-leveling begun at 1310' A.T. at RR.

1310' — 1355' 45" — hiatus

1355' 45" — 1360' 50" — hiatus for 2'. Upper 3' is a rather calcareo-arenaceous ss with: *I. carinatus* a, *S. perplana* c, *S. pernata*, *C. scutulus*, *A. erectum*, *C. coronatus*. Most of the stone is a coarse arenaceous shale. One of the shells here looked suspiciously like *S. demissa* but is probably a more coarsely ribbed *S. perplana*. At the bottom are slabs of a splinter like those so abundant below the Kingsley reservoir was also seen.

1360' 50" — 1375' 65" — hiatus

1375' 65" — 1380' 70" — 2' of coarse arenaceous shales with *S. pernata*, *I. carinatus*, *A. lanceolatus* sp, *A. dactylum*, *C. scutulus*.

1380' 70" — 1385' 75" — *I. carinatus*, *M. concentrica*, *M. tripartita*, *C. coronatus*, *C. tenuistriata*, *S. dudleyi*, *P. patulus*, *A. princeps*, *A. erectum*, *Goniophora* sp. The rock is a coarse sh., blue gray in color.

1385' 75" — 1390' 80" — } sandy shales

1390' 80" — 1395' 85" — } 12' vertical in a

cliff. Fossils: *P. flabellum* cc, *A. spiniferoides*, *I. carinatus*, *I. exigua*, *A. lucina*, *S. perplana*, *Goniophora* sp., *C. bellistriata*, *B. krenistria*, *P. oviformis*.

✓ *S. andaculus*, ✓ *S. perplana*, ✓ *S. pinnata*
M. concentrica, ✓ *D. pinnatus*

1405' 95"

1395' 85" — 1405' 95" — 11' of same shale
 with ✓ *C. scitulus*, *M. concentrica*,
C. bellistriata, ✓ *D. carinatus*, ✓ *S. pinnatus*,
Isabellaria arginata, ✓ *S. andaculus*.

1405' 95" — 1410' 100" — same

1410' 100" — 1415' 105" — 1' at bottom
 sandy blue grey shale. — *H. dehayi*,
S. andaculus, *P. flabellum*, *D. pinnatus*, &
C. scitulus.

At 1415' 105" there are to be seen
 made up almost completely of fossil
 forms noted in this ls. are:

<i>D. pinnatus</i>	<i>D. carinatus</i>
<i>H. dehayi</i>	<i>D. levis</i> ?
<i>S. granulosa</i>	<i>Cystodictya</i>
<i>C. scitulus</i>	<i>S. perplana</i>
<i>C. coronatus</i>	<i>S. arctostriata</i>
Crinoid stems	

Probably 1411' 100"

The last 4' hiatus.

1415' 105" — 1420' 110" — 3½' hiatus — exposed
 2' are composed of sandy shales
 with *C. scitulus*, *S. pinnatus*,
C. boothi, *Isabellaria* sp., *D. carinatus*.

1420' 110" — 1425' 115" — same blue grey
 sandy shale with: — *M. concentrica*,
S. pinnatus, *P. scitulus*, *S. andaculus*,
D. carinatus, *Isabellaria* sp.,
P. marginata, *P. flabellum*.

Probably top of Lnd +
Port. Pt.

1425' 115" — 1430' 120" — 2 can. str.,
P. cristallid, Monophora sp., Cystodictya
P. flabellum, A. decussata,

The rocks of this interval are hard
and sandy and are responsible for
a considerable flat in the ravine.
The uppermost foot of this rock
is of hard calcareo-arenaceous rock
like that seen in the upper part of
the Stroud Quarry at Lebanon.

1430' 120" — 1440' 130" — hiatus

1440' 130" — 1445' 135" — in the middle
of this interval there is about ~~2~~
4' of soft bluish dark grey shales.
These have L. pennatus. This shale
is soft and has very little grit.
About 1437' was seen a layer about
2" thick of calcareo-arenaceous sh.
which may belong to the Fisherton
but is probably a slab out of place.
Other fossils noted in the soft sh.
are a thin sandy layer in it are
L. carinatus, S. pennatus,
P. radiata?

1445' 135" — 1450' 140" — hiatus

1450' 140" — 1455' 145" — soft blue grey
crumbly shales with —

✓ H. bellistrot	✓ C. muscoratus
✓ L. boothi	✓ P. radiata
✓ P. bellidops	Mon. ✓ H. corbuliformis
✓ M. pygmaea	✓ M. mytiloides
✓ C. coronatus	✓ B. annata
✓ B. umbonata	✓ P. plana
✓ C. bellistrot	✓ H. triquetra

These rocks are definitely Moscow and the whole ravine to the road is in Moscow rocks. Moscow rocks were also seen in the road on the top of the hill to the west of the gully. There are about 50' of Moscow shown here.

Gully on high hills S.E. of Lebanon.

~~The ^{bottom} of the~~ ~~Genesee~~ The bottom of the Genesee is at the road intersection at about 1705' A.T. Twenty-five feet below ^{base} top of Genesee is undoubtedly Hurbiton with *L. laura*. 16' below ~~top~~ bottom of Genesee were found brown shales that are either Tully or Moscow; they had no fossils. About 3' of liatus exists between the bottom of the Genesee & the first exposed Tully, going downhill. Actually about 10' of shaley ls. is exposed. 1685'

October 9.

Beach's Quarry

About 25' vertical, 100' horizontal -
calcareous sand shales breaking along
the bedding into thin slabs more than
1/2' thick or into irregular chunks,
jointing very irregular. In the middle
layers are thin beds of hard, blue
gray (dark), some dark shale, some
cherty ls. Greenish content high.
Fossils most abundant above
commonly concentrated along layers
or in layers.

Fossils:-

- | | |
|--------------------------|--------------------------------|
| ✓ <i>S. pennata</i> a | ✓ <i>Leptæna</i> sp. |
| ✓ <i>A. caninata</i> a | ✓ <i>A. triquetra</i> |
| ✓ <i>S. deniscæ</i> or | ✓ <i>S. granulosa</i> c |
| ✓ <i>S. cornuta</i> or | ✓ <i>S. periplana</i> r |
| ✓ <i>Psectiporus</i> or | ✓ <i>P. oviformis</i> |
| ✓ <i>A. griseus</i> | ✓ <i>A. halimæ</i> |
| ✓ <i>P. flabellum</i> or | ✓ <i>M. concentrica</i> |
| ✓ <i>Leptæna</i> sp. or | ✓ <i>M. mytiloides</i> |
| ✓ <i>Cyrtina</i> or | ✓ <i>C. decussata</i> |
| ✓ <i>A. erectum</i> or | ✓ <i>R. verrucosa</i> |
| ✓ <i>P. emarginata</i> | ✓ <i>C. coronatus</i> or (top) |
| ✓ <i>C. porthus</i> | ✓ <i>R. grandis</i> |
| ✓ <i>H. laevis</i> | |

Stone from this quarry used on
road west of Lebanon between Lebanon
& Georgetown. This quarry, the top of it
is at about 1360' A.T. that 486' faces
in the glass south of its highway
crossing.

2nd Ravine
East of ~~Day~~
Stroads

Oct 9.

A ravine with Moscovy.

Exposures from about 1450 - 1580 or 1600
Upper portion around 1580 was very
sandy. *Orthis* seen in the bottom.
A. decubata was noted at about
1490' A.T. & is same horizon as at
Moore's ravine at about 1495'. The
exposure is excellent but was not
worked in detail.

The bottom of the Moscovy here
must be near the road intersection
at 1435' A.T.

Oct 9.

Exposures on Stone Mill Brook just
below ravine.

About 25' of coarse blue gray shales poorly
exposed in the banks. Fossils are

Camarotoechia sp.

Spurifer sp.

U. rogersi

Leptotaria sp.

U. lineata

S. laura

Leptotaria sp.

✓ *S. pleurana*

S. caninata

S. submarginata

✓ *R. marginata*

S. punctata

Oct 9th

Ravine

Handbell at 1210' above Stone Mill Brook

1210' - 1255' 43" - beds

1255'45" — 1260'50" — blue grey arenaceous
shales exposed for 4' at bottom of
step. Fossils are rare:—

D. bisulcata

O. undulata

C. cf. congregata etc.

1260'50" — 1265'55" — same in 3' of a
cascade but hiatus for lower 2 1/2'.

1265'55" — 1270'60" — top of cascade
sandy shales ~~with~~ or fine ss.
I found no fossils, altho they must
exist here.

1270'60" — 1275'65" — sandstone & shales
with: — *Spirifers*, (like those below Kingsley's dam)
C. coronatus

3' of ss at bottom with *Spirifers* (Kingsley
Bench). *C. coronatus*

1275'65" — 1280'70" — hiatus — 5'5"

1280'70" — 1285'75" — a couple feet of slabby
ss at the top.

1285'75" — 1290'80" — 5'5" of slabby
which have the appearance of those
in the H. Quarry. The layers or slabs
have the appearance of cross-bedding
as some of the layers slope one way
while others slope in the opposite
direction.

Fossils are *Camerozoechia* sp.
C. coronatus, *A. spinifer* (same as at
 Kingsley Brook) These stones look like
 those below the stone at Kingsley
 Brook.

1290'80" — 1295'85" — same — some of
 the *Camerozoechia* in these layers
 strongly suggest the ss. north of
 Georgetown On the road to W. Eaton

1295'85" — 1300'90" — same but
 greatly covered and not workable.

1300'90" — 1305'95" — a hard brownish
 ss. in which I saw no fossils This
 stone for about 7 or 8' is not shaly
 but breaks in chunks as tho it were
 calcareous.

1305'95" — 1310'100" — hard ss breaking
 into chunks

1310'100" — 1315'105" — same but
 with — *Camerozoechia*, *C. coronatus*
 and *L. rogersi*. *S. granulatus*.

1315'105" — 1320'110" — same sandy stone
 with *S. granulatus* & *L. rogersi*
S. pennatus

1320'110" — 1325'115" — *liatus*

1325'115" — 1330'120" — "

1330'120" — 1335'125" — "

1335'125" — 1340'130" — "

1340'130" — 1345'135" — at top 4' of
 blue gray sandy shales with blue
 coloring.

S. pinnatus c.
C. scitulus
Pol. constricta

P. flabellum r.
T. carinatus cc

Fluvial stone is somewhat calcareous
 but is predominately a sandy sh.

1345' 135" — 1350' 140" — liat.

1350' 140" — 1360' 150" — liat.

1360' 150" — 1365' 155" — blue-grey sandy sh
 with *M. oblongatus*, *S. pinnatus*

1365' 155" — 1370' 160" — sandstones & shale,
 with

A. erectum c.
T. carinatus c.
C. coronatus c.

A. princeps

1370' 160" — 1375' 165" — Blue grey sandy sh
 with *B. lida*, *S. pinnatus*

1375' 165" — 1380' 170" — same - shale. Break
 in regular chambers - must belong
 near Beach's Quarry horizon

1380' 170" — 1385' 175" — *S. pinnatus* a,
T. carinatus c, *C. bellistriata*, *C. scitulus*

1385' 175" — 1400' 180" — same - The shale
 is, in these three steps, predominately
 a sandy sh with *Pachymura*. Fossil
 could not be extracted from the
 narrow leaf-stem gully.

1400' 190" — 1415' 205" — hiatus

1415' 205" — 1420' 210" — hard ss, probably calcareous in thin patches — no fossils could be extracted

1420' 210" — 1445' 235" — hiatus — except at about 1423' 210" where there was a small patch of calcareous-arenaceous shale. Possibly P.P.

At 1445' 235" — were found shales with *A. umbonata*, they were blue grey & soft. This is the Moscow. The Moscow then comes in between 1423' 210" & 1445' 235". Moscow is shown in patches to the end of the ravine but was not studied.

1445' 235 + 70' 70" = 1515' 305" — to road =
~~1514~~ 1540' AT. at road

281

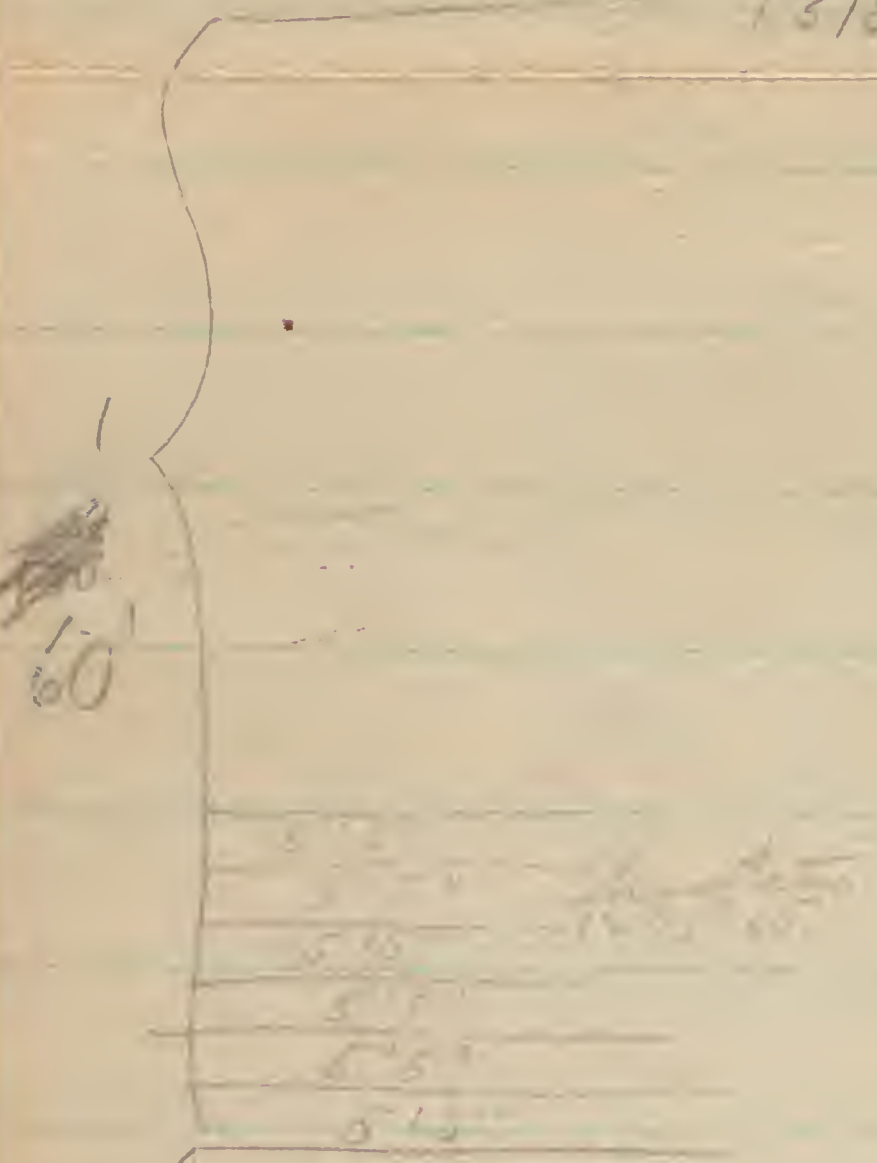
$$\begin{array}{r} 1435 \\ 1210 \\ \hline 225 \end{array}$$

$$\begin{array}{r} 1210 \\ 278 \\ \hline 1488 \end{array}$$

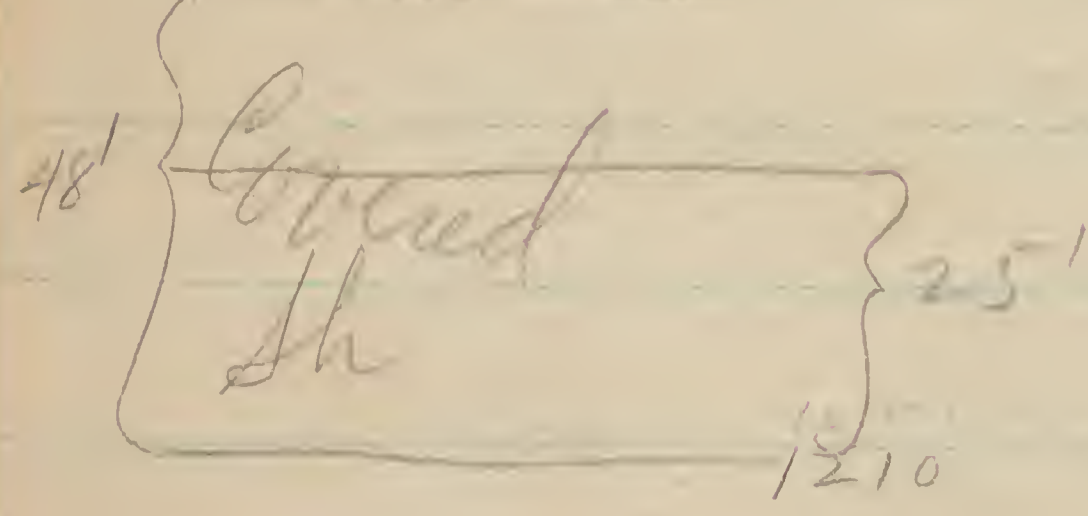
$$\begin{array}{r} 1435 \\ 1210 \\ \hline 225 \\ 60 \\ \hline 285 \end{array}$$

$$\begin{array}{r} 5 \\ 16 \\ 48.4 \\ 10.10 \\ 4 \\ 22.8 \\ 21.9 \\ 18.3 \\ 11 \\ 5.5 \\ 3 \\ 4 \\ 1.4 \\ 2.4 \\ 2.5 \\ 24.5 \\ 2.7 \\ \hline 218' \\ 60 \\ \hline 278 \\ 3 \\ \hline 281' \\ 218 \end{array}$$

1318'



125' at



60'
48'

Morrisville quad

Sept 11.

Small Brook contains Randallville shale
with large *L. laura*

1928

Sept. 11'

Hand leveling begun at 1515'.

1515' - 1575' 60" - covered

1575' 60" - 1590' 75" -

Arenaceous shale, like that exposed on the
property ^{opposite} of the non-pareil Stock Farm at
Middle Port.*L. laura* a*P. rana*

Fenestellids

A. andersoni

Crinoid stems

*S. pennatus**Orthoceras* sp.

1590' 75" - 1595' 80" - same shale

*I. submarginata**L. laura* a (large)*S. pennatus**S. arcuata*, *I. carinatus*

1595' 80" - 1600' 85" - shale coarser, thin beds ss.

L. laura a1600' 85" - 1655' 140" - cross-bedded ss. mixed with
thin layers of shale that below. At the top
was seen:*P. flabellum* cIn a small side gully a few
yards north of the main gully: hand leveling
from 1590' 75"

1590' 75" - 1610' 95" - covered

1610' 95" - 1615' 100" - very shaly ss. for the upper 3'

1615' 100" - 1620' 105" - sand-suppled, top 2' in
cross-bedded ss.1620' 105" - 1630' 115" - mostly covered, ss. in
patches.1630' 115" - 1655' 140" - cross-bedded ss containing
P. flabellum in abundance.

$$\begin{array}{r} 1440 \\ 49 \\ \hline \end{array}$$

$$\begin{array}{r} 176 \\ 60 \\ \hline 236 \end{array}$$

At the top (and continuing to 2' above this interval) is hard calcareous-arenaceous rock containing the following fossils:

<i>S. divaricatus</i> re	<i>S. pubescens</i>	<i>R. vanuxemi</i> re
<i>R. fimbriata</i> c	<i>C. sopphe</i> re	<i>P. obovatus</i> re
<i>S. sculptilis</i> a	<i>P. rana</i> re	<i>M. concentrica</i> re
<i>T. crinitus</i> re	<i>L. perplanus</i> re	<i>I. exigua</i> re
<i>T. annulus</i> c	<i>A. decussata</i> re	<i>P. emarginata</i> re
<i>D. inaequistrata</i> re		

Imagine this 30' below burned down house on hill or at 1465' A.T. By handlevel from road above it 1667' A.T. The *Dittleria* beds are calcareous-arenaceous, & the lower bed is about 4" thick. However the rock splits up like a coarse shale.

Handleveling from the road intersection puts the top of the Pompey (shale) bed with *S. pinnatus* at 1489' A.T. Handleveling directly from the top of the Pompey shale bed to the base of the *S. sculptilis* bed yielded a thickness of 236'. I do not believe that this containing there is correct.

Sept 11²

River outside of Eaton has Pompey-Rand contact 851' above the small stream, then at about 1340' A.T. 75' of Randallville is exposed above the same level re.

1978

Sept. 12th

460 paces downstream from highway is an exposure of Ludlowville rocks, hard & sandy which become a soft shale in about 25-30' down. I believe this is essentially the rock just above the *Pholidostrophia* bed at the ravine just east of Erieville. I believe the Portland Point comes in somewhere about 1740' A.T. Ludlowville rocks exposed for 60' \pm .

Sept 12th

The mystery of the Delphe here is solved. There are huge Delphe blocks resting on an exposure of sparsely fossiliferous Randallville sh. which had:

*I. submarginata**L. laura**Leptæa*Sept 12th

Top of Delphe exposed 10' below Morrisville Eaton Road. There may be about 5' more of Delphe. Cross-bedded ss of Pompey is 11 steps up from highway. Top of Pompey must be about 10' above last exposed ss. making the Pompey about 70' thick. Top of Pompey is estimated here at 1365' A.T. Top of Delphe about 1295' A.T.

8
90
35
55

Bradley
Booth, 4th

968

Sept. 14.

H. G. Seeley for Red Gate ls Red Gate in gully
behind this house. Across the road to
John & Sterle's place having exposures of
the Colgate ~~ls~~ in an ~~excavation~~ excavation behind
the place. In the gully on Sterle's I recall shall
and ss. of the Lower Carlville. Seeley's is on
the east side of the road.

Fossils in Red Gate at Seeley's.

<i>R. vancouveri</i>	<i>A. reticulatus</i>	<i>A. marginata</i>
<i>Platyceras</i>	<i>P. rana</i>	<i>Cyst. lam.</i>
<i>C. coronatus</i>	<i>Centronella?</i>	<i>A. granulosa</i>
<i>S. pervesa</i>	<i>S. permatum</i>	
<i>S. divinator</i>	<i>T. carinatus</i>	

969

Bradley Brook
1978

969

Sept 11³

Red Gate ls consists of about 10"-1' of hard ls.

Fossils are:-

Corals c

A. reticularis

C. coronatus

J. carinatus

At the contact with the shale *S. divanatus* is not uncommon. One of the corals is a compound Cyathophylloid and looks much like *A. davidsoni*. This exposure of Red Gate ls. is about 5' above undoubted Union Quarry rock.

The lowermost part of the Red Gate consisted of about 4" of very hard crinoidal ls with corals. Then followed coarser less pure crinoidal ls. with corals. The upper bed had corals & a considerable admixture of dark shale.

29) 208
174
32

Sept. 13.

Murphy's Gully

Top of Delphi 65' above bridge = 1225' above sea-level.

1225' - 1250' 25" - covered.

1250' - 1255' 30" - dark grey sandy shale containing very few fossils. *Orthoceras* sp., *H. bellistriata*, *H. oblongatus*. The large *H. bellistriata* is quite characteristic and was found above the *Leptodictyon* and *Ambolochia* beds of the lower Pompey on Payne St. It was also seen in this Gully above the first Delphi exposure seen in the Guadalupe Valley.

1255' 30" - 1265' 40" - rock slightly coarser, large *P. constricta*

1265' 40" - 1275' 50" - same arenaceous shale. *P. patula*

1275' 50" - 1280' 55" - same " "

1280' 55" - 1285' 60" - " " "

1285' 55" - 1300' 75" - mostly covered. At the top of this interval the rock is much coarser and has *H. depayi*.

1300' 75" - 1305' 80" - calcareous arenaceous rock and thin bedded ss.

1305' 80" - 1305' 85" - covered Top of Pompey

~~1305' 80" - 1305' 85"~~ - hard calcareous-arenaceous rock of the upper Pompey.

Fossils are:-

<i>P. flabellum</i>	<i>C. mucronatus</i>	<i>C. congreata</i>
<i>A. serpens</i>	<i>S. pinnatus</i>	<i>E. lindblaei</i>
<i>C. coronatus</i>	<i>A. fasciculatus</i>	<i>A. cora</i>

Very top bed has:

R. perplana c
P. flabellum
R. wanneri c

A few inches of arenaceous slate at the top has:

L. perplana *S. pennatus*
R. vancouverensis *P. flabellum*

The Pompey here is apparently ~~just~~ 87' thick and throughout presents no features not seen elsewhere, except in the bulk of more fossiliferous sandstone and the absence of ^{a great thickness of} ~~the~~ cross-bedded layers at the top. There is some so at the top but it not thick & slabby as at the exposures on Electric Light stream. Bedding here is shown by layers of fossils. The upper 3' of rock seems to be calcareo-arenaceous and massive. The top of the Pompey is estimated to be at 1312' A.T.

Sept. 10.
Road to Eaton

Intersection of road on west side of valley with the Eaton road is at 1250'. 16' above the intersection was seen 3 1/2' of sandy and impure ls. containing irregular masses of blue grey purer sandy ls. It weathers to a brown sandy stone. In this rock *C. congregata*, *S. addaculus* abound. Other fossils seen are *P. flabellum*, *A. erectum*, *Goniophora hamiltonensis*, *Platyceras* sp., *D. sculptilis*, *H. deharzi*. All of these except the *Camerozoechies* and *Spirifers* are in minor amounts. Other fossils are *S. granulatus*?, *M. concentrica*. This exposure has just recently been opened during the road building operations. *C. corruptus* and *T. carinatus* are very rare. *Favosites* lam., occurred at about 1270' associated with large and small *Spirifers* and *Camerozoechies*. The rock has an irregular fracture into thick layers of 1" to 6".

C. indenta
S. perplana

Cran. lam.
L. macroptera.

at 1270' 20" the same rock is seen but beginning about a foot above this interval the lime increment begins to disappear and the rock becomes more shaley. also different forms come in and others seen in abundance below disappear. Some that were uncommon in the hard sandy ls. become common in

the shales,

From 1270' 20" - 1275' 25" in a rock becoming increasingly shalier were seen

✓ *P. flabellum* c

✓ *J. carinatus* (transverse)

~~*C. boothi*~~

✓ *Cran. hamiltoniae*

✓ *M. concentrica* c

✓ *P. spinulicosta*

✓ *H. dekeyi*

Cyathophyllum sp.

Nepluticas sp.

Schuchertella

✓ *S. granulatus*

P. patulus

Fossils found with the corals are:

M. concentrica

P. flabellum.

Same *Spirifer* as occurs below with the *Camarotoechia*

✓ *P. maxima*

✓ *Pal. concentrica*

~~*P. patulus*~~

✓ *G. truncata*

✓ *Bow. hamiltonensis*

✓ *A. princeps*

✓ *S. crotalum*

✓ *S. perplana*

✓ *L. macroptera*

✓ *S. cheungensis*

C. boothi

✓ *C. complanata*

J. bellulus.

~~*Pal. concentrica*~~

The corals mark the end of the calcareous matter and about 1 foot below the top of the interval rather soft shales contain:

✓ *Pal. concentrica*

Prod. spinulicosta ✓

C. mucronatus ✓

Pholidops cc

✓ *J. carinatus* c

Camarotoechia sp.

M. pygmaea

H. dekeyi

S. crotalum

M. subulata

P. flabellum.

P. rana

M. concentrica

C. boothi

The zone with *Pholidops* is at
1274'25"

1275'25" - 1280'30" at about 1276'25" *Pholidops*
is still present in ~~an~~ argillaceous sh.
About 1279'30" a *Loxonema* was found,
also *H. actis*, *T. submarginata*. 5'-8' above
1279'30" *H. micula* must come in and
there begins the Delfin Falls section.
8' above 1279'30" is a section of about 15'
of rock representing my Eaton horizon
below the New Gyrus.

1280'30" - 1285'35" - very little rock exposed
here but mostly soft blue grey shale
with *Lox. hamiltoniae*

1285'35" - 1290'40" - comes a large cut
exposing 15' vertical of shale.

1285'35" - 1295'45" - shale with following

<i>H. micula</i>	✓ <i>P. spinulicosta</i>
<i>H. dekaigi</i>	✓ <i>P. liata</i>
✓ <i>P. sectifrons</i>	✓ <i>S. crotalum</i>
✓ <i>B. sulcomarginata</i>	✓ <i>Lox. delphicola</i>
Mandible	✓ <i>A. erectum</i>
✓ <i>P. constricta</i>	✓ <i>C. boothi</i>
✓ <i>M. concentrica</i>	✓ <i>H. oblongatus</i>
✓ <i>Lox. ham.</i>	✓ <i>H. sandalli</i>
✓ <i>P. patulus</i>	✓ <i>S. bisulcata</i>
✓ <i>C. conjugata</i>	<i>Paraneka</i> sp.
✓ <i>H. actis</i>	✓ <i>A. umbonata</i> r.
✓ <i>T. cuneatus</i> r	

1290'45" — 1305'60" — ^{between 1300 + 1305} here was seen an olive grey sandy shale rock like that at the New Syn.

1305'60" — 1385'140" hiatus
 1385'140" — 1390'145" — In the middle of this interval is a foot of sandstones, blue grey with tiny brown weathering specks. These contained *P. flabellum*, *Gov. cf. hamiltonensis* and *Camerozoechias*. They must belong to the Fertile horizon. They are found just at the house. At the ~~end~~ bend in the road near the curve

1390'145" — 1400'155" — about 5' below the top here soft shales are seen. and at the top of the hill at the bend of the road are about 15' of soft shales, my upper Eaton horizon of argillaceous blue grey shale.

Sept. 10.

Section along Eaton cement road East from English Ave. English Ave intersects the cement highway at 1260'. At 1285' 25" - sandy shales of the Eaton horizon like those on the east side of the hill. Fossils here are

<i>H. dekeyi</i> c	<i>C. congregata</i> m	<i>A. erectum</i>
<i>P. flabellum</i> c	<i>B. sulcomarginata</i>	<i>T. exigua</i>
<i>C. tenuistriata</i>	Large <i>Spinifer</i>	

They are exposed here for 1 1/2 steps

1285' 25" - 1295' 35" - near Top of Hymn as noted above, about 8' vertical

1295' 35" - 1305' 45" - hiatus

1305' 45" - 1315' 55"

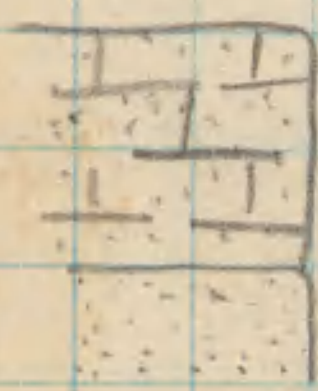
rocks of New Hym horizon. About 11' of rocks exposed very well on the south side of the road but also on the north side. These same rocks may also be found on the southern hillside above the dam at the small reservoir and just west of the Eaton station. These rocks are the same as those exposed at the Hymn as shown by *M. mytiloides* and *R. obsoleta*.

1315' 55" - 1390' 130" - hiatus

At about 1392' 136" is found slabby sandstone like that on the east side of this hill at 1390' 145". *N. arguta* was the only fossil noted here.

1390' 130" - 1395' 135" - noted above. At the top of this interval are 3' of rock. The lowest part of which is a broad

Compact ss. On top of this compact ss, which clearly belongs to the Fertile horizon and has *N. arguta* and *P. flabellum*, there comes 2' of hard calcareous sandy ls. with considerable shak in it. This rather abruptly rests on the ss.



2' calcareous with shaly ss.

1' ss.

1396
140
11

The contact comes at about

1396' 135" A.T. This calcareous

sandy rock is compact and hard and is brown on the weathered surface with irregular black splashes of dark sandy clay. It greatly resembles the sandy ls. of the Burchard quarry but has a different fauna:—

- Orizulopecten*
- ✓ *P. flabellum*
- ✓ *C. mucronatus*
- ✓ *S. perplana* c
- ✓ *R. vanuxemi* c
- ✓ *N. arguta* re
- T. exigua*
- ✓ *S. pernatus*
- ✓ *A. spiriferoides* ?
- ✓ *M. concentrica*
- ✓ *S. granulatus*

- A. trebratulid* (Eunella?)
- ✓ *A. princeps*
- C. mucronatus*
- ✓ *C. scutulus*
- ✓ *Athyris* sp.
- Cystodectya*
- P. rana*
- C. boothi*
- ✓ *E. lindelaeni*
- Conularia*

On this the dark shales with *Vetulina* on the silty part of this rock *Myosas* abound in association with abundance of *S. pernatus*.

15' Soft
sh.

3' 0-3'

1400' 155"

1395' 120"

1394' 193"

1401
1070

Dark
Shales.

3' 1-2'

1395' 135"

1394' 130"

90' 89' Covered

1395'
12
407

1395'
11
1406

83' Covered

57
26

1315' 135"

11' 11"

11' Lign

1305' 48"

1300' 57"

1295' 45"

1290' 40"

1285' 35"

15'

15' Covered
Lign

13' 3"

1295' 35"

32'

1280' 30"

1279' 30"

1274' 25"

1" 1/2' 1/2' 1/2'

1275' 25"

1270' 20"

1220
1217
43

3 1/2'

1265' 15"

1406
1276
130
54
17

1260'

1260'

1255'

1250'

16'

826

826

Dart Glen

Top of Delfia is at 1120' A.T. on the Little Rise. First exposures in Dart Glen are in the arenaceous shales of the Pompey 32' above the highway. 70' above the road or at 1200' comes the top of the Pompey; in the hard sandy rocks leaving *R. Vainuxenii*. On the 70' interval is one large patch of arenaceous shale and several exposures in the bed of the stream. The dip of the Delfia would probably add 3 or 4' to the Pompey and there may be a foot or 2 at the top which is covered. Hence a reasonable estimate of the thickness of this member would be 75'.

The first 5' above the Pompey is covered but in the next 5' interval comes the soft Randallville sh. The following fossils were seen in the Randallville between 45'45" and 50'50":

<i>A. umbonata</i> c	<i>L. papposa</i> c
<i>A. spiniferoides</i> c	<i>R. Vainuxenii</i> c
<i>C. indentata</i> (small) c	<i>S. pennata</i> c
<i>M. pygmaea</i> re	<i>M. corbuliformis</i> re
<i>C. rhynchonatus</i> re	<i>P. constricta</i> re
Top here	<i>J. submarginata</i> re

65' above the top of the Pompey comes 3' of hard calcareous arenaceous rock and thin beds of ss. See thesis for fauna. This brings to 68' above the Pompey. Hauling of the Randallville begins here.

Exposures of sandy shale are good for 70' above this falls making 136' of nearly continuous exposures. At 136' above the Pompey is a road in the golf links above which the gully has been largely choked with

$$\begin{array}{r} 106 \\ 136 \\ \hline 242 \\ 1200 \\ \hline 1442 \end{array}$$

earth covering any exposures. From this road for 96' to the base of a 10' exposure of undoubted Colgate ss. the rock is largely covered. This Colgate ss. ~~which~~ the top of which is at 1442' must be near the top of the Colgate as it forms a flat here.

Handlevelling in Darts is practically started from the top of the Delft!

Sept 7. 1928

Univ. Quarry

40' high, from rippled, ss. crossbedded at base. Shows thin layers of ss. & black shale the latter frequently containing *P. fragilis*. One noteworthy bed on east face is 5' above base. The top of the quarry is at 1471' A.T. The ^{top of the} quarry in the golf links comes at about 1346' A.T.

In small ravine E of campus is 17' of rock the top at 1310' A.T. The top contains *P. glabellum*, *R. vancouveri*, *L. perplana*, *Cithyrus*, *Bryozoa*:

Assign this to the Pompey although the complete sequence is not present. The rocks below the top are very sandy shales having very few fossils. A peculiar rosetted bryozoan and *P. costata* alone were noted. I believe that this is near the top of the Pompey, altho it may be in the Randallville.

Sept 7.

Gully in Hemlock Grove. (Behind E.D. Murphy)

New Gym (Delphi (top)) is at 1230' above sea-level. 84' above this comes the hard arenaceous layer with *L. perplana* and *R. vancouveri* the top of the Pompey.

June 15⁽⁶⁾

C.W. Hamilton's Ravine

Grey shales occurring at 1575' 3' above base (at 1578') the shales are blue. Here fossils are abundant as, *S. pennatus*; large *Camarotoechias*, Other fossils here are:-

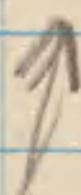
<i>A. spiriferoides</i>	<i>M. concentrica</i>
<i>P. muta</i>	<i>P. flabellum</i>
<i>N. concinna</i>	<i>H. dehayi</i>

At 1591' the shales are somewhat harder forming a cascade in the stream. *P. flabellum* & *S. pennatus* were noted here. *S. pennatus* is not like that of the U. Queen but more like Earlville kind. The top of the second cascade which is at 1596' is composed of sandier stone which is flat and slabby in places but soon again gives the irregular fracture. *S. pennatus* is at the level, but fossils are quite scarce here. The very top of the second cascade is an arenaceous shale with *S. pennatus* and *T. carinatus*. The second cascade is at 1602'

At 1602' is the contact of the hard arenaceous shale with a soft argillaceous shale containing many fossils. A calcareous layer only a few inches thick rests on the arenaceous shale layers. This contains many fossils especially large *Strophodonts*. In this layer is a bluish shale with

<i>S. pennatus</i>	<i>I. submarginata</i>
<i>T. carinatus</i>	<i>P. flabellum</i>
<i>P. radiata</i>	<i>S. perplanus</i>
<i>N. oblongatus</i>	<i>Productella</i> sp.
<i>C. brevifrons</i>	

1618'



1602'

soft
becoming
hard

1575'

Blue shales at base
becoming sandy
above

The weathering of the two kinds of rock at 1602' is in strong contrast. The lower harder stone weathers into large irregular blocks, that above into small irregular chips or fragments.

At 1607' the stone is again harder and contains *S. pennatus* & *T. cuneatus* in abundance. An unusual *Cimitaria* was found here.

At 1613' the stone is hard and has *L. rogersi*, *C. coronatus* ^(large form), *a. erectum*, *S. pennatus*. A small *chonetes*, (*C. vicinus*) is very abundant here. Between 1607 & 1613 the stone has become progressively more massive. The same holds for the interval between 1613 & 1618'.

Sept. 28.

Hamilton's Ravine - Restudied

Hand levelling begun about 1540' A.T. or
200 paces N. ~~W.~~ of Hamilton's residence.

1540' - 1545' 5" - sandy sh.

1545' 5" - 1550' 10" - blue grey sandy sh.
at the bottom with *D. arcuata*,
S. pennatus, *A. spiniferoides*, *S. papilion*,
I. cheamungensis,
P. fucoides, *D. arcuata*, *Canarotrichia*,
C. scitulus, *P. flabellum*, *M. conicum*.

1550' 10" - 1555' 15" - the rocks have
become very hard and sandy
breaking into large flat slabs!
S. pennatus, *S. lina* of large size
This is apparently the same horizon
as at the bottom of Burton's Blk.

1555' 15" - 1560' 20" - This interval +
3' brings us to the top of the so
horizon which is exposed in
the top 3' of shabby ss. but at
1563' 20" the rock is a softish
shale with ~~as profuse~~ fauna.
I. carinatus C. *S. papilion* c.
Pal. fucoides *C. boottii*
Sideriessa
Canarotrichia sp.
A. spiniferoides
S. gemma?

Fossils here are most abundant
just at the contact.



15-23

15-23

5-15"

This layer correlates well with the one in Burton's in which *S. demissa* + large *Strophodontes* were abundant.

1560' 20" — 1565' 25" — This shale on top of the ss. is seen for 5'. This interval includes $3\frac{1}{2}'$ of the ss + about 2' of the lower part of the sh.
C. coronatus in top of ss.
 1565' 25" — 1570' 30" — hiatus

1570' 30" — 1575' 35" — blue grey sh.

✓ <i>J. carinatus</i> a	✓ <i>J. chemungensis</i>
✓ <i>P. tenuis</i>	✓ <i>H. triquetra</i>
✓ <i>S. pennatus</i> .	✓ <i>O. carinata</i>
✓ <i>H. oblongatus</i> .	✓ <i>H. acilis</i>
✓ <i>P. emarginatus</i>	✓ <i>C. coronata</i>
✓ <i>A. erectum</i> .	✓ <i>P. lanceolata</i>
✓ <i>S. pennatus</i>	✓ <i>C. scitulus</i>
✓ <i>S. perplana</i>	✓ <i>P. constricta</i>
	✓ <i>J. submarginata</i>

This horizon looks like the *Pelagypora* zone below the second *demissa* bed.

1575' 35" — 1580' 40" — near the top of this interval ✓ *S. pennatus* is very abundant, also ✓ *J. carinatus*. Less abundant are: — *P. flabellum*, *S. tullius*?, *Agonolopex* sp., ✓ *C. micronatus*.
 The rock is quite arenaceous here.

1580' 40" — 1585' 45" — very sandy sh with ✓ *C. coronatus*, ✓ *C. micronatus*, *S. pennatus* a, and *J. carinatus*.
 This is the last rock seen.

~~1585' 45" — 1590' 50"~~
~~1590' 50" — 1595' 35"~~

sandstone slabs in the stream debris here have *S. demissa*. They are from the head of the ravine somewhere

Ravine along Euville Road leading east to Entell Reservoir.

First rock exposed at about 1590' A.T.

1590' - 1600' 10" — hard blue grey sandy shales with:—

✓ <i>S. carinatus</i> a.	<i>O. parvulus</i> ?
✓ <i>S. pennatus</i> a.	<i>O. undulata</i>
✓ <i>P. ventum</i>	<i>M. oblongatus</i>
✓ <i>S. circularis</i>	<i>M. trifurcatus</i>
✓ <i>P. lanceolata</i>	<i>C. coronatus</i>
<i>M. mytiloides</i>	<i>I. subcylindricus</i>
<i>S. cheungensis</i>	<i>B. erectus</i>

1600' 10" - 1605' 15" — same sandy grey shale with

✓ <i>S. pennatus</i> a.	✓ <i>S. tellus</i> ?
✓ <i>S. carinatus</i>	<i>C. micronatus</i>
✓ <i>P. ventum</i>	<i>Leptina</i> sp.
✓ <i>C. coronatus</i>	

There is some lime here & brachiopods are abundant in the Calcareous aggregations.

1605' 15" - 1610' 20" — same shale coarser. Favosites. 3' above the top of this step are coarse ss. which split into irregular slabs. And this forms a flat in the valley

1610' 20" — 1615' 25" — ss — except for the one or 2 which are calcareous —
arenaceous and have the following fauna: —

- | | |
|-----------------------------|---------------------------|
| ✓ <i>S. periplana</i> | ✓ <i>R. vanuxemi</i> |
| ✓ <i>M. concentrica</i> | ✓ <i>P. flabellum</i> |
| ✓ <i>Fenestellids</i> | ✓ <i>S. concava</i> |
| ✓ <i>S. granulosa</i> | <i>P. rara</i> |
| ✓ <i>C. tenuistriata</i> | ✓ <i>S. pennatus</i> |
| ✓ <i>Gon. hamiltonensis</i> | <i>C. boothi</i> |
| <i>A. decussata</i> | ✓ <i>P. emarginata</i> |
| <i>Par. hamiltoniae</i> | ✓ <i>G. reticularis</i> |
| ✓ <i>S. solenoides</i> | ✓ <i>A. trebratalid</i> |
| ✓ <i>Cory corah</i> | ✓ <i>G. suspens</i> |
| | ✓ <i>A. spiniferoides</i> |
- Shells here 1620

The upper 4" here is composed of hard resistant shell ls. The stone is composed of the conjoined fragments of fossils. This stone is responsible for the flat in the valley. Fossils in this rock are: —

- | | |
|-----------------------------|--------------------------|
| <i>P. iowensis</i> a | <i>R. vanuxemi</i> |
| <i>Pholidops</i> (large) re | <i>P. rara</i> |
| <i>C. boothi</i> | <i>H. deKayi</i> |
| <i>S. periplana</i> | <i>Spinifers</i> etc. |
| <i>A. decussata</i> | <i>Aviculopecten</i> sp. |
| | <i>C. coronatus</i> |

1615' 25" — 1620' 30" — an inch of shale on the ls. has *M. concentrica*, *C. scutella*. The shale is soft, blue grey. Heaters for 5' 4".

1620' 30" — 1625' 35" — This interval is composed of soft dark blue grey shales, much like the Moscow in appearance. They are quite gritty.

Fossils.

✓ *S. globosa*
 ✓ *T. carinatus*
 ✓ *M. oblongatus*
 ✓ *M. triquetra* c
 ✓ *C. sicutulus*
 ✓ *Pal. perplana*
 ✓ *S. solenoides*
 ✓ *M. corbuliformis*
 ✓ *S. pennatus*
 ✓ *C. elongata*
 ✓ *O. carinata*

S. submarginata
 ✓ *M. variosa*
 ✓ *A. spiniferoides*
C. boothi
~~*P. radiata*~~
 ✓ *C. bellistriata*
~~*P. radiata*~~
S. arenata
M. concentrica
O. parvula
P. radiata etc

cl in a small gully on the south; -

1625' 35" - 1630' 40" - same as above

1630' 40" - 1635' 45" - rock somewhat coarser -

T. carinatus, *M. concentrica*, *S. pennatus*,
C. bellistriata,

1635' 45" - 1640' 50" -

Aviculopenta sp., *T. carinatus* a,
S. pennatus. At the top of this interval the rock is hard & sandy with a tendency to be slabby.

1640' 50" - 1645' 55" -

S. pennatus, *T. carinatus*. The rock is hard ss. No rock is exposed above this interval. *M. concentrica*.

cl in coarse sandy shale. In the upper part of this layer the following species were seen: -

S. pennatus c
T. carinatus c
M. concentrica
S. perplana
A. spiniferoides

C. bellistriata
S. andaculus
P. flabellum
A. princeps
P. radiata

C. scitulus
S. emeaty?
M. subalata
P. patulus.

S. solenoides
M. pygmaea
S. Channingensis

I believe that this bed above the *Pholidostrophia* band corresponds to a similar one at the top of the first falls at Fabius and that the "Wichener" should be about 60 or 70' above the *Pholidostrophia* band. This layer from 1620' 30" - 1645' 55" may represent the bed below the upper *S. demissa* layer.

Calcareous band at 1620'. Lower part calcareo arenaceous micaceous sand. shale 1'; ls (shell-sand shale 4").

990

$$\begin{array}{r} 2 \\ 33 \\ 15 \\ 15 \\ 4 \\ \hline 75 \end{array}$$

16

$$\begin{array}{r} 6 \\ \hline 22 \end{array}$$

990

Sept 19.

Georgetown Ravine (west, with Jolly at 1635). Hand-leveling was begun at the confluence of this creek with Otsego Creek and this is at 1440' A.T. The first rock is encountered at 8 steps + 3' above the confluence of these creeks. The first rock seen is at 1486' A.T. The lowest rock is a sandstone that contains considerable shale and many fossils. The fauna in the first 2' is as follows:-

T. carinatus cc.*Aviculopecten**S. perplana* re

At 1488' A.T. the rock is shaley and with ls. lenses and abounds in *T. carinatus*. Other fossils are:-

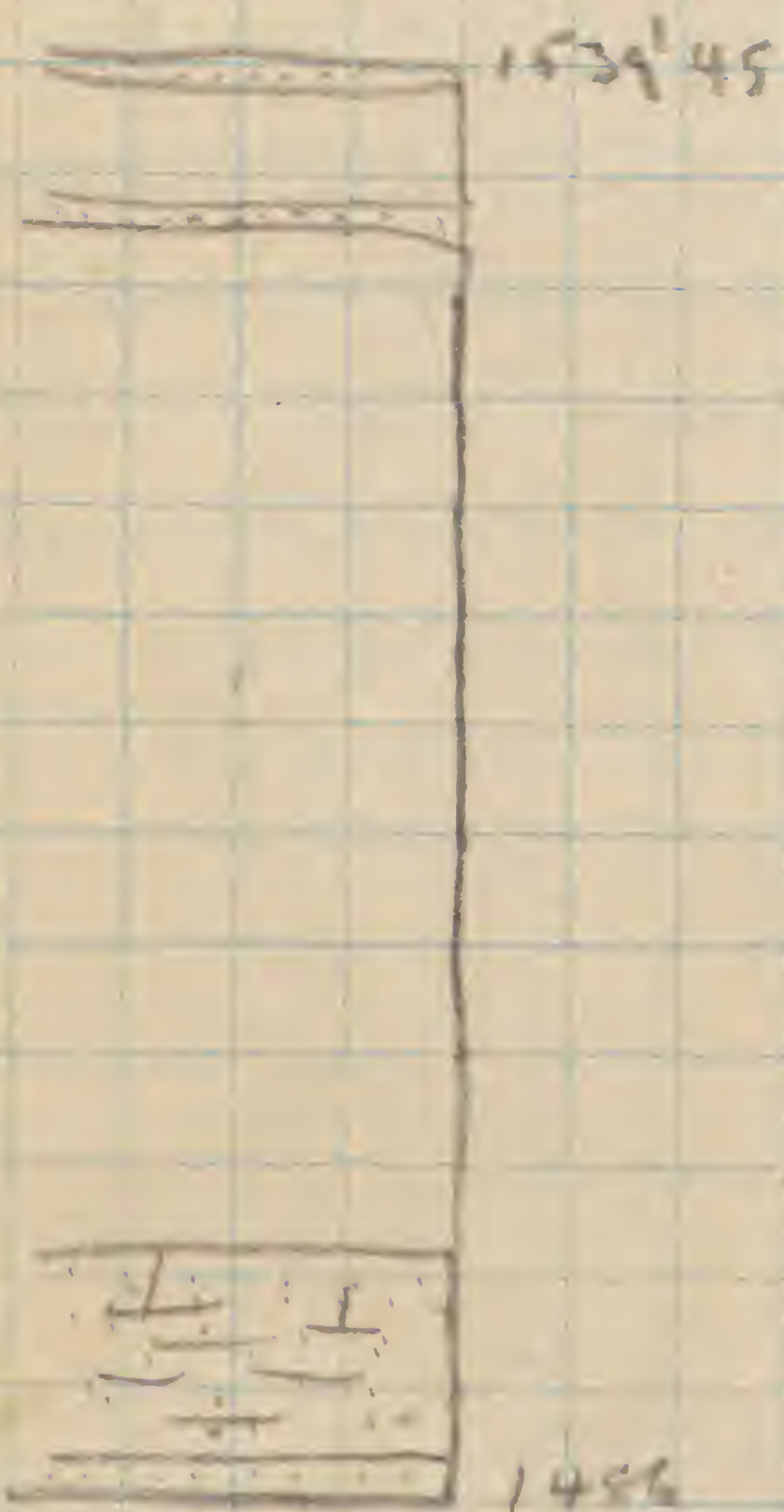
*T. carinatus**S. granulatus**S. pennatus**R. vanuxemi**P. oviformis*

The striking point of this lower 2' of rock is the large numbers of *T. carinatus* present. Abundance of *T. carinatus* was one of the characters of "Tichenor" at Fabius.

1494

At 1488' 9" the rock is a hard blue-grey shale and is such up to 1494' 2". Fossils in this interval are:-

*A. reticularis**S. pennatus* c*T. carinatus* cc*C. mucronatus* c*H. triquetra**H. acilis**M. pygmaea**M. mytiloides**S. granulatus**E. liackblaei*?



Each sq 3'

C. recurva
R. vanuxemi re
Pal. constructa
M. concentrica
S. arctostriatus
✓ S. granulatus
A. serpens
Camarotoechia
Cyrt. ham.

P. rana
O. thoceras sp.
Cyrtolites sp.
T. exigua
Grammysia sp.
A. decussata ?
S. perversa
S. perplana

These beds are rather sandy and in places seem calcareous, but give no effervescence. However if the rock is crushed or powdered it gives a good effervescence.

1494' - 1499'5" - There are only 2' of rock exposed at the bottom of this interval. The rock is a coarse grey sandy shale abounding in *Brachiopods*:

✓ S. granulatus cc
M. concentrica r
A. serpens r
S. arctostriatus r

Pal. hamiltoni
R. vanuxemi re
G. capillaria r
A. reticularis r

✓ A. spiriferoides r
T. carinatus c
✓ S. pennatus c
S. perplana r
O. thoceras sp. r
 abundance of *S. granulatus*

This stone when fresh is quite calcareous. One striking feature of it is the great abundance of *S. granulatus*.

1499'5" - 1504'10" - hiatus

1504'10" - 1509'15" - the top 5' of this horizon commences the more typical Moscow

shale. It is a blue grey rather dark but soft shale with many fossils. Here were seen: -

✓ *S. pennatus*

Lingula sp.

P. lara

✓ *P. mitta*

Orbiculoides

S. crotalum

✓ *M. oblongatus*

✓ *A. reticularis*

✓ *M. lamellata*

Chaetetes

S. arcuata

✓ *C. setigerus*

✓ *M. bellistriata*

✓ *C. mucronatus*

C. boothii

Pterinopecten

✓ *M. concentrica*

✓ *Pal. constricta*

P. patulus

Cystodictya

B. capillaria

The shale here was somewhat brittle and hard. No particular fossil characterized is zone. The rock weathers to a brown color. Fossils not very abundant

1509' 15" - 1514' 20" - same shale -

✓ *S. pennatus* c

P. lara

Orbiculoides

✓ *M. concentrica*

✓ *R. fimbriata*

Cystodictya

✓ *D. carinatus*

✓ *A. reticularis*

S. crotalum

✓ *M. triquetra*

✓ *M. pygmaea*

Cystolites sp.

✓ *M. liata*

✓ *M. oblongatus*

✓ *R. variegatus*

✓ *P. radiata*

✓ *P. plana*

✓ *C. mucronatus*

✓ *P. constricta*

P. discoides

S. granulatus

P. patulus

Par. lara

I. exigua

✓ *M. bellistriata*

✓ *I. submarginata*

✓ *S. solenoides*

Lox. lara

✓ *A. spiriferoides*

Orthis sp.

Grinoid stems

P. emarginata

A. decussata

✓ *M. mytiloides*

P. lanceolata

✓ *S. arcuata*

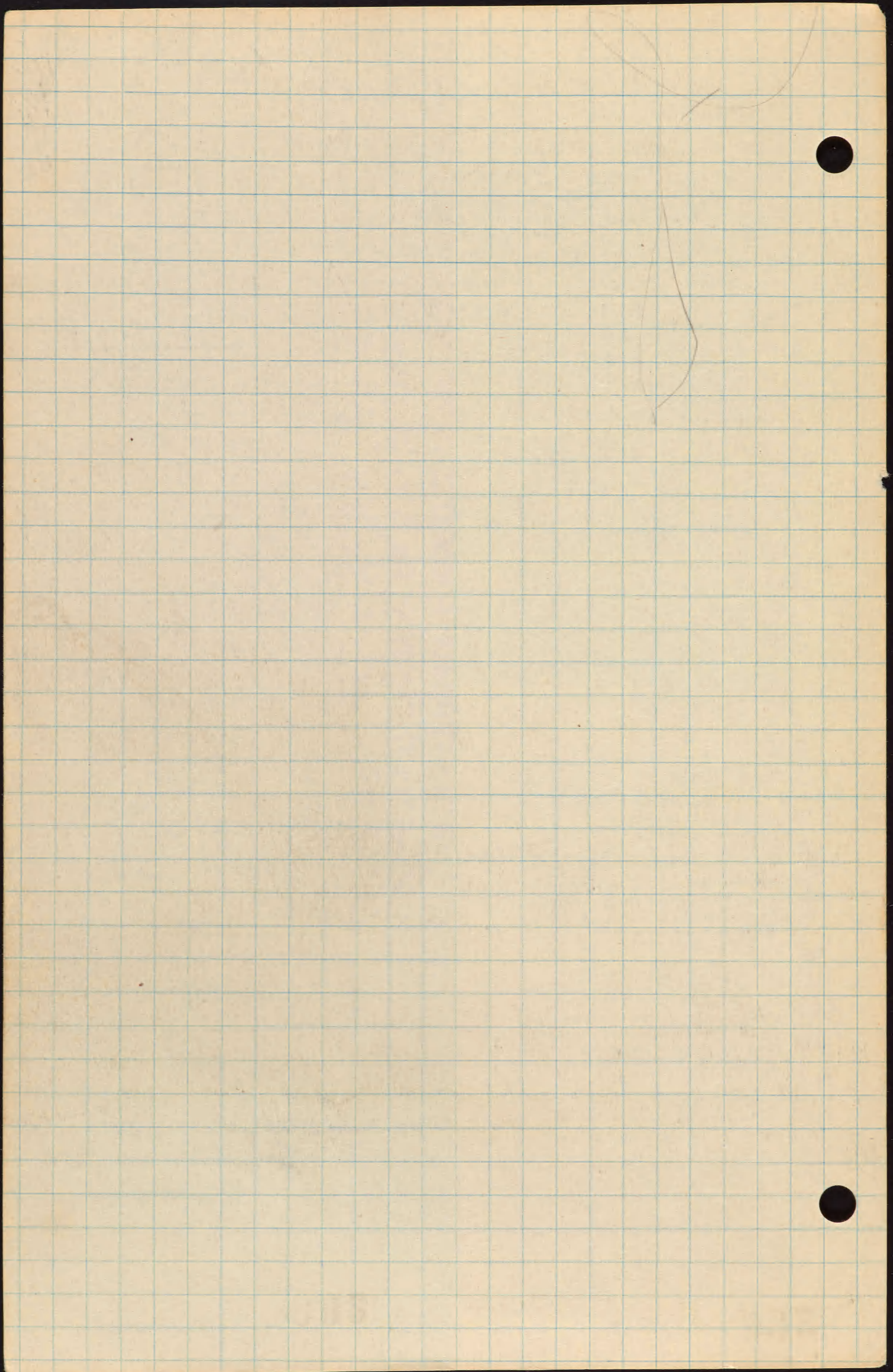
✓ *M. mytiloides*

I. submarginata

C. bellistriata

✓ *M. corbuliformis*

P. mitta



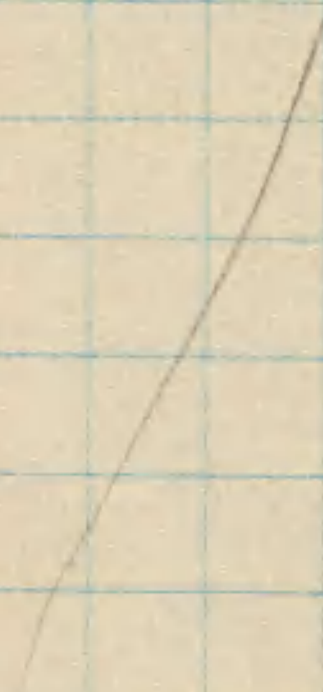
1514'20" — 1519'25" — *S. crotalum*, *P. radiata*
Crinidea, *Platycerus* sp., *S. pinnatus* &
P. rana, *T. corinatus*, *P. nuda*, *S. crotalum* &
S. clunigenensis, *C. boothi*, *M. mytiloides*
N. liata, *N. bellistriata*, *C. scitulus*.
S. granulatus.

The rock here fractures easily into
 irregular lumps, is rusted and
 weathered to a chocolate or purple
 brown color.

1519'25" — 1524'30" — hiatus
 1524'30" — 1529'35" — "
 1529'35" — 1534'40" — "

1534'40" — 1539'45" — Hard sandy rock
 for 1 1/2' at the bottom. This
 contains: — *S. crotalum*, *P. emarginata*
T. carinatus, *P. tenuis*, *L. laura*, *S. pinnatus*,
A. reticularis

The *Leiorhynchus* are very large
 and belong to the shale on the 1 1/2'
 sandstone, the fauna of which could
 not be examined. The ss. causes a
 small cascade. ~~At~~ 5'5" above this
 ss band comes another only 6"
 thick with no fossils. The shales
 between are dark almost black
 and abound in *L. laura* with
 few other fossils. They are very much
 like the Genessee and just below
 the 6" ss. are soft and break into
 very thin chips.



Handwritten text, possibly a signature or initials, located near the bottom center of the page.

Just below the 6" ss: -

S. tullius

C. boothii

M. pygmaea

I. submarginata

C. situlus

P. emarginata

N. oblongatus

1539'45" - 1544'50" - dark, soft shales.
with *S. tullius*, *P. discoidum*. About
2' above the 6" ss which is only a
large lens, and probably one of

1539'45" - 1634'140" = 1645' to base of Tully
Sept. 23.

a discontinuous series.

In the dark shales of this interval
fossils are thickly aggregated and
matted in the rock.

H. bellisliata

I. carinatus

P. emarginata

L. laeta cc

S. pennatus

M. pygmaea

A. spenferoides n.

C. mucronatus

S. tullius c.

N. laeta

I. submarginata

A. praenubona

M. subalata

N. oblongatus

This appears to be a representative
of the *A. praenubona* zone(?).

$$\begin{array}{r} 38 \\ 16 \\ \hline 54 \end{array}$$

1544' 50" - 1549' 55" - The shales are here blue grey, rusted red-brown and have less fossils than those immediately below. The Leiorhynchus - Ambocoelia zone appears to end at about 1544' 50" - Fossils noted in the bottom 2' of this interval are:

M. concentrica cc

A. spiniferoides c.

R. vanuxemi

P. emarginata

S. Andamalus

N. corbulariformis

P. productella ag.

C. undulata

T. carinatus

Orthoceras sp.

S. tullius

Fenestellids

B. leda

H. lirata

Top 2 or 3' hiatus

1549' 55" - 1554' 60" -

blue grey sh. bitoniac

P. emarginata

F. submarginata

S. perbassus

P. rana

Pol. constricta

Leiopteria

Crinoid stems.

S. tullius

T. submarginata

1554' 60" - 1559' 65" - blue grey-arenaceous shales with few fossils - *H. varicosa*, *G. constricta*.

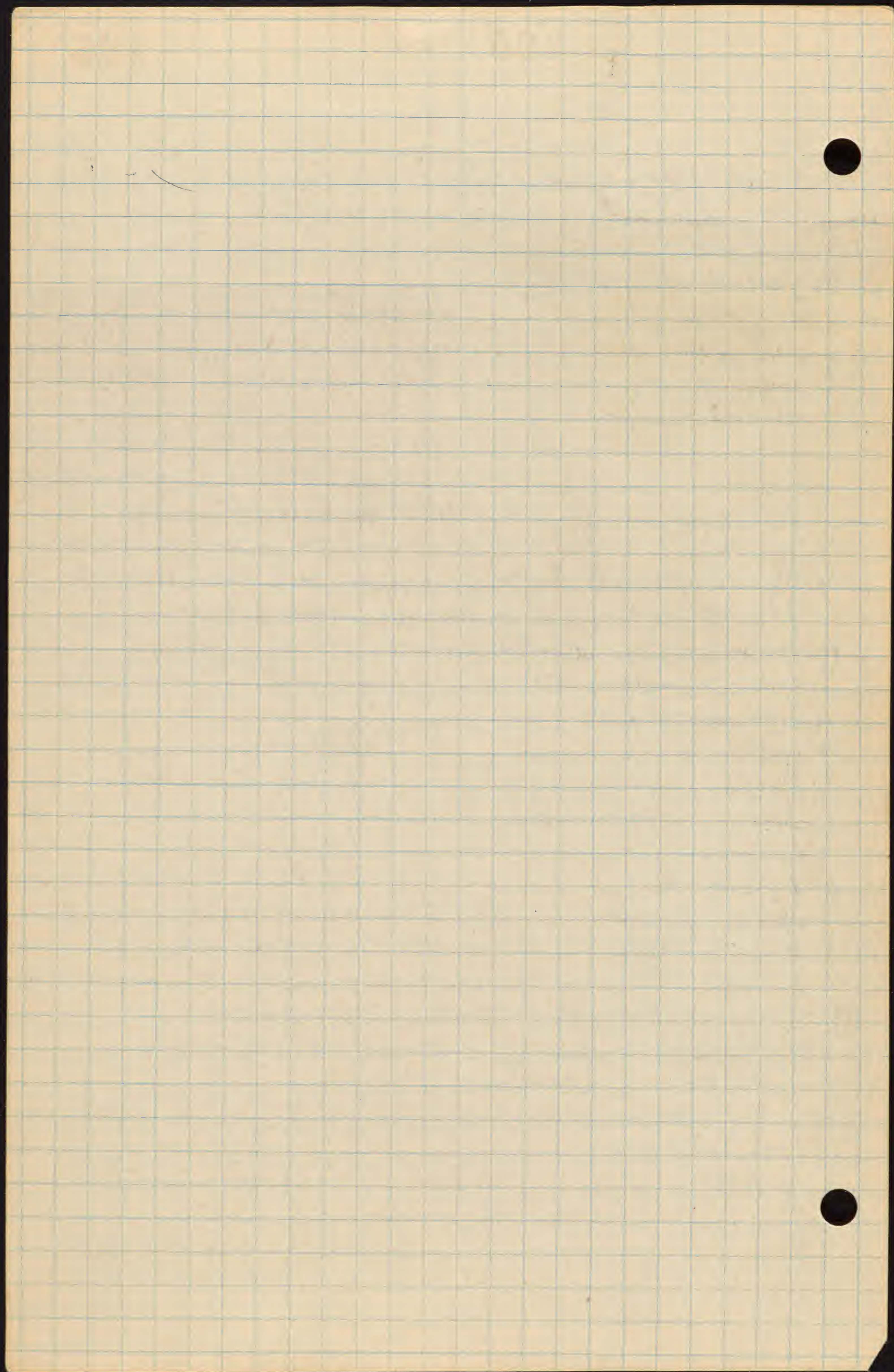
1559' 65" - 1569' 75" - blue grey sandy sh with some very resistant sandy bands.

Crinoid stems, *Pol. constricta*, *S. tullius*,

S. perbassus, *T. carinatus*,

Fossils are not abundant in this interval.

1569' 75" - 1574' 80" - the rock at the top of this interval is very hard and sandy. It contains *S. granulosa*,



A. serpens, *I. carinatus*, *R. fimbriata*,
P. emarginata, *C. mucronatus*, *S. tullius*
Platyceras sp.
 1574' 80" — 1579' 85" —

The sandy stone band which is only a few inches thick is succeeded by blue grey sandy shales with few fossils.

1579' 85" — 1584' 90" — 5' of this interval is composed of sandy shale rock capped by 1 1/2' of calcareo-arenaceous rock, very resistant and with corals and calcareous lenses filled with fossils at the bottom:—

✓ <i>R. varicostis</i> c	corals. r
✓ <i>S. granulatus</i> c	<i>C. bellistriata</i> r
<i>S. perpluma</i> re	<i>P. rana</i> r
<i>I. carinatus</i> re	<i>C. coronatus</i> r
<i>A. decussata</i> r	<i>P. maxima</i> re
<i>M. concentrica</i> r	✓ <i>S. pennatus</i> r
<i>Favosites</i> r	<i>C. boothii</i> r

This rock has the appearance of that in the quarry on the hill east of Georgetown. The calcareous lenses are all thru the 1 1/2'.

Strophodonts sp. — large

1584' 90" — 1589' 95" — on top of the calcareous sandy rocks come dark blue grey softer shales. These have the following fossils:—

<i>P. carinatus</i> c	<i>Favosites</i> (small)
<i>Cyrt. lamm.</i>	
<i>S. pennatus</i>	
<i>C. tenuistriata</i>	

1589' 95" — 1594' 100" — hard sandy shale, resistant and forming a flat in stream bed:—

S. granulatus c

S. pennatus r.

Can. hamiltoniae r

C. bellistriata r

S. perplanus r

M. subolata r

Conularia sp. v.

A. spiniferoides c

J. carinatus c

M. concentrica r

J. bellulus r

G. cuneatus r

R. vanuxemi r

1594' 100" — 1599' 105" — At the bottom of this interval the shales become finer and carry smaller fossils

S. pennatus

M. subolata

J. submarginata

N. corbutiformis c

N. bellistriata

P. discoidium

L. laura

C. setigerus

M. oblongatus

Orbiculoidea sp.

The shales below are rather sandy & brittle but become darker & softer above

1599' 105" — 1604' 110" — same

1604' 110" — 1609' 115" — same — concretions are abundant in the soft dark shales. They contain *L. laura* in abundance & also *S. pennatus*. *Pholidops*.

1609' 115" — 1614' 120" — same but *L. laura* very abundant and of large size. *J. carinatus*, has now come in

1614' 120"

1624

1642

1622

45

1629 135
1634 120

5-5-1

3

7 1/2
5 1/2

1641

1635

1614' 120" — 1619' 125" — same sh.
L. laura cc, *N. oblongatus* Pal, *emarginata*
J. carinatus, *C. bellistriata*, *C. setigerus*

1619' 125" — 1624' 130" — In about the middle of this step *L. laura* disappears and the shales become a lighter blue grey & do not break into such small chips. Also the fauna changes.

✓ *R. fimbriata*

✓ *V. pustulosa*

✓ *S. pennatus*

✓ *S. junia*

C. boothi

R. vanuxemi

✓ *S. inaequistriata*

A. serpens

✓ *S. perpallana*

C. bellistriata

✓ *A. reticularis*

✓ *S. concava*

Lox. sp.

H. dehayi

C. tenuistriata

J. bellulus

The ls. specimens collected Sept. 21 are from this horizon

1624' 130" — 1629' 135" — This step comes within 1 1/2' of the base of the Tully. This 1 1/2' has already been collected. Tully is at 1642" A.T.

Fossils in this interval are

Leiopteria sp.

V. pustulosa

S. solenoides

P. constriata

C. boothi

✓ *C. coronatus*

J. exigua

M. mytiloides

S. pennatus

✓ *S. andaculus*

N. corbuliformis

✓ *J. carinatus*

1642

1633

There are 158' of Moscow shales exposed almost continuously in this ravine. From the *A. praecumbens* zone to the bottom of the Tully there are about 93' of shales! The hard rock bearing corals and crinoids probably belongs to the Quarry on the road east of Georgetown. Above this horizon with corals came the 2nd. horizon with *L. laura* and this gives way near the base of the Tully to a layer with *V. pustulosa*!

Along the road here above the farmhouse at 1740 are to be seen in the road-gutter a hundred or more feet of the Sherburne sandstones and shales.